A Synopsis of the Mammalian Fauna of the Philippine Islands

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Abstract

The mammalian fauna of the Philippine Islands is now known to include 201 species: 22 are marine mammals, 172 are native terrestrial mammals, and 7 are introduced, non-native species that occur in the wild. With 111 (64%) of the terrestrial native species as endemics, the archipelago has one of the highest per-area levels of endemism in the world, on the basis of both absolute numbers and percentage. Since the last checklist was published, in 1987, 16 new species have been discovered—currently one of the highest rates of discovery in the world (Morell, 1996); 14 of the species listed here are not yet formally described. For each species, we provide the citation for the original description (except when the species has yet to be formally described), the English common name, the documented distribution, a summary of habitat data, and an assessment of conservation status. At least 52 native species are threatened (many seriously endangered) as a result of destruction of forest habitats, over-hunting, and destruction of cave and marine ecosystems. Further basic research and implementation of effective habitat protection programs, especially for the forests, are essential to protect this remarkably diverse and endangered fauna.

Introduction

The mammalian fauna of the Philippine Islands is remarkably diverse and species rich. As documented in this study, the terrestrial fauna is now known to include 172 native species (plus 7 introduced species, most of which are widespread in the country), which is one of the highest levels of diversity on a per-area basis in the world. An additional 22 species of marine mammals have also been recorded. Moreover, most of the species are found nowhere else: of the 172 terrestrial species, 111 (64%) are endemic. As noted by Cole et al. (1994) in their review of global patterns of mammalian diversity, only Madagascar has a higher percentage of unique species. However, only about 80 of the 100 mammal species on Madagascar are endemic, and Madagascar has twice the land area of the Philippines (Heaney, 1993). Although no comprehensive analysis has yet been done, we believe that the Philippines have the highest level of endemic mammalian species richness of any country on a per-unit-area basis.

These species include some of the most spectacular radiations of mammals. The murid rodent fauna of Luzon has long been considered to be one of the most remarkable assemblages of mammals (Thomas, 1898). To name only a few, there exist giant arboreal animals with long, lush coats of shiny black fur (Oliver et al., 1993); exceptionally long-snouted, hopping rodents that feed principally on earthworms in mossy forest (Rickart et al., 1991); tiny brown mice that dig through leaf litter in their search for insects (Rickart et al., 1991); and beautiful mice with large dark eyes, pure white bellies, and auburn heads and backs that scamper along forest floor and through treetops (Balete & Heaney, in press). It is not surprising that these creatures have generated great interest over the century since biologists first learned of their existence from the native peoples of the Central Cordillera of Luzon.

The Philippines also are exceptional in a second sense. As we report here, recent field work

has revealed the presence of 16 new species of mammals in the last 10 years, since the last checklist was published (Heaney et al., 1987). This rate of discovery is matched in only a few other countries (Brazil and Peru), and those are more than ten times as large as the Philippines (Morell, 1996; Wilson & Reeder, 1993). Because all of these newly discovered species are endemic, the estimate of the rate of endemism for the Philippines has risen and likely will continue to rise.

Finally, and most important, the mammalian fauna of the Philippines is exceptional in a third sense. The most recent International Union for the Conservation of Nature (IUCN) Red Data List (Baillie & Groombridge, 1996) includes 49 threatened mammals from the Philippines, which is seventh in total number for any country but first when the sizes of the countries are considered. The recognition that the Philippines have the most extensively endangered mammalian fauna in the world is supported by the even more recent Philippine Red Data List (Wildlife Conservation Society of the Philippines, 1997), which lists 52 species as endangered in the country. One of the primary purposes of this synopsis is to provide consistent information on the conservation status of all mammalian species in the country, with an indication of the limitations of current information, so as to serve as a guide both to current conservation efforts and to research that will provide even better information in the future.

Content of the Synopsis

We have compiled an updated checklist of all mammalian species known to occur in the Philippines, including 14 as yet undescribed species. We include, for the first time, a complete listing of the marine mammals known or likely to occur in the Philippines, based on a large amount of recent field work by M. L. Dolar and her colleagues. This checklist contains updated and more detailed information on the distribution of each species than has been available previously, and for the first time we have added brief synopses of the habitat associations of every species.

Under species entries, we have cited relevant publications that have appeared since the last checklist (Heaney et al., 1987), along with critical earlier references. For additional earlier publications, readers should consult that publication (Heaney et al., 1987) and the annotated bibliography of Balete et al. (1992).

Distributional Patterns of Philippine Mammals—In describing the distributions of species, we often refer to the zoogeographic regions of the country; these are shown in Figures 1–3 (from Heaney, 1986). The map in Figure 1 is based on the extent of the islands in the Philippines during the late Pleistocene period, when the development of immense continental glaciers had, in effect, removed water from the world's oceans, so that sea level was 120 m lower than it is today (Heaney, 1991a). Each of these Pleistocene islands defines the limit of a distinct fauna (Alcala, 1976; Dickerson, 1928; Everett, 1889; Heaney, 1985b, 1986). The three largest faunal regions thus defined are the Luzon Faunal Region (including Luzon, Catanduanes, Marinduque, Polillo, and several small islands), the Mindanao Faunal Region (including Mindanao, Basilan, Bohol, Leyte, Samar, and adjacent small islands), and the Palawan Faunal Region (including Palawan, Balabac, Busuanga, Culion, Cuyo, and adjacent small islands). Some other islands coalesced into islands larger than those of today (e.g., there was a single island from Tawi-tawi to Jolo, and an island including Negros, Panay, Cebu, and Masbate), whereas other islands remained isolated (e.g., Camiguin, Sibuyan, Siquijor, and Mindoro).

The recognition of these faunal regions is an important aid in understanding the present distributions of Philippine mammals. However, our knowledge of distribution is far from complete. Many small islands have never been surveyed, and many moderately large islands are poorly known. New distributional records are discovered by virtually every regional survey, particularly among the more poorly known taxa (especially bats and rodents). Further field work is essential to determine the distributions and habitat requirements of many species, to document the faunas of the smaller island groups, and to carry out the alpha-taxonomic studies that are necessary to de-

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Fig. 1. Map of the Philippine Islands, showing the locations of most of the islands mentioned in the text. Areas within the −120 m bathymetric line are indicated; these show the limits of islands during the most recent "ice age" and correspond to the limits of Philippine faunal regions.


118°
122°
126°
Batanes Islands
0
200km
Less than 120 meters current water depth
Babuyan Islands
18°
16°
Pacific Ocean
Luzon
South China Sea
Polillo
GREATER LUZON
Manila
Lubang
Marinduque
Romblon
Mindoro
Sibuyan
Catanduanes
Albay Gulf
Ticao
14°
Busuanga
Culion
GREATER PALAWAN
Tablas
Masbate
Samar
Maripipi
Biliran
Visayan Sea
Panay
Guimaras
Negros
Cebu
Leyte
Dinagat
Siargao
Panay Gulf
GREATER NEGROS-PANAY
Tanon Strait
Cebu Strait
Bohol
Pamilacan Is.
Bohol Sea
Camiguin
Siquijor
10°
Palawan
Sulu Sea
Balabac
Balabac Strait
Mindanao
Basilan
Davao
Davao Gulf
Mapun Is.
Tawitawi
6°
GREATER MINDANAO
Jolo
Borneo
GREATER SULU
Celebes Sea
118°
122°
126°

termine species limits and to discover new species.

The distribution of marine mammals in this synopsis is based on surveys, published records of occurrence, strandings, fishery by-catch, and skeletons found on beaches. Not all of the marine habitats have been surveyed, and thus the absence of records of a given species from any given area may result from the lack of surveys rather than real absence. Most surveys have focused on the waters of the Visayan region such as the eastern Sulu Sea, Tanon Strait, Bohol Sea, Panay Gulf, and parts of the Visayan Sea (see Fig. 1 for their locations). Other areas recently surveyed include the southern Sulu Sea, Davao Gulf, and parts of the Celebes Sea in the southern Philippines. No thorough survey has been done in northern Philippine waters, although reports of cetacean sightings and strandings from this region have been included in this checklist.

Fossil Mammals

As noted in the last checklist of Philippine mammals (Heaney et al., 1987), very little is known about the fossil mammals of the Philippines. All known species are large-bodied (elephants, rhinoceros, deer, pig, and buffalo; Fox & Peralta, 1974; Groves, 1984, 1985); their large size contributes to the likelihood of both preservation and discovery. Smaller species are currently entirely unknown, although they undoubtedly were present. The discovery of new material is certain to add an exciting new dimension to our understanding of the history of the fauna, and may provide clues to the long-term interactions between humans and the native fauna of the country as well as provide the means to test many of the current models of speciation, colonization, and extinction for Philippine mammals (e.g., Heaney, 1986, 1991b).

Procedures Used in Compiling This Synopsis

As with our prior checklist (Heaney et al., 1987), this paper is intended as a working list of the mammals of the Philippines. We have not provided full taxonomic synonymies; earlier papers (Alcasid, 1970; Taylor, 1934) should be consulted for this information. We have used Wilson and Reeder (1993) as our starting point for species names, taxonomic authorities, and higher categories.

We have not included subspecies designations in this synopsis, for two reasons. First, the use of subspecies names implies detailed knowledge of geographic variation, and such information is rarely available for Philippine mammals. Virtually all subspecies names now in use need to be critically reevaluated. Second, we believe that use of subspecies would distract the reader from more crucial issues of general distribution and conservation status.

Common Name—Because common names often assist in increasing public interest in animals, we have chosen in this paper to provide English common names for Philippine mammals. In one respect, this has been a relatively easy matter: because English is a foreign language, there were virtually no English common names in use until about 100 years ago. English names have thus been coined almost entirely by biologists. With a few exceptions, we have chosen not to include names in the many languages of the Philippines because many local names are in use, with different names often used for the same species in different linguistic areas, and sometimes a single name is in use for different species in different linguistic areas. Most of the few that we have included are coming into use as English names (e.g., *kagwang* and *tamaraw*). A complete compilation of native names would be a worthwhile and instructive effort but is beyond the scope of this paper.

In choosing English common names to include here, we have retained most names that are well established; these are for species that are widespread in Asia, marine mammals, or large, conspicuous species. Some small species that occur outside the country have established English common names, but often several have been used. In such cases we have retained the names where we felt they were suitable, but in some instances we have coined new names that are more informative and more consistent with the biology of the animals. For the many species for which no English names are in use, we have coined names. In doing so, we have tried to make the names informative about the ecology, distribution, or appearance of the species. In some instances this has simply involved translating the Latin species name where that is suitably descriptive. We have avoided long names and patronyms, and we have attempted to make names interesting to the public, for whom these names are primarily intended. Where two

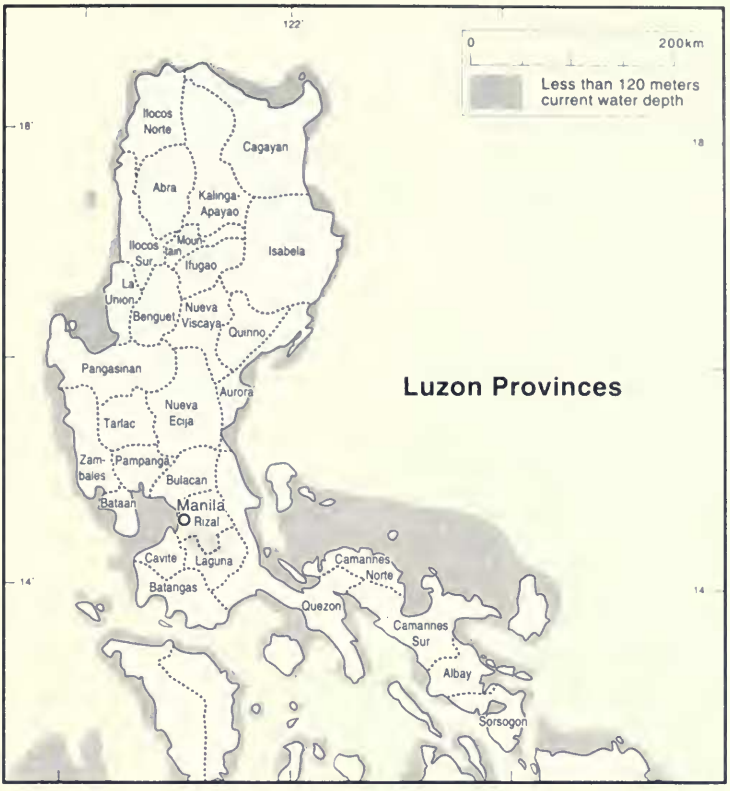

FIG. 2. Map of Luzon showing the boundaries of provinces in 1995.

roughly equivalent common names are available, we list both, with our preferred name listed first.

DISTRIBUTION—The distribution of many species of Philippine mammals is poorly known. This is true primarily because little effort has been made to survey many islands, and even less effort has been made in the mountainous areas to which many species are restricted (e.g., Mindanao: Sanguila & Tabaranza, 1979; Tabaranza, 1979). This problem is being addressed by ourselves and others, and is critically important to forming a detailed and accurate picture of mammalian distribution in this geographically and ecologically complex archipelago. In this synopsis, we restrict our statement of distribution to a summary of the islands on which each species has been found, with the exception of Luzon and Mindanao; on those two large islands we report each province in which a species has been found (provincial boundaries are mapped in Figs. 2 and 3). The provinces that are shown are those that existed during the late 1980s and early 1990s when we conducted our studies; readers should be aware that provinces in the Philippines are split as the human population grows, and so their boundaries are unstable. For example, South Cotabato Province was split in two in late 1995, with the northern portion retaining the same name and the southern being named Sarangani Province.

The term "faunal region" refers to the centers of endemism that are defined by the extent of Pleistocene islands shown in Figures 1–3. The six largest faunal regions are Greater Luzon, Greater Mindanao, Greater Palawan, Greater Negros-Panay, Greater Mindoro, and Greater Sulu, but others (e.g., Sibuyan and Camiguin) often have endemic species as well. General distributions of species can be envisioned by referring to the accompanying maps (Figs. 1–3).

In addition to the problems posed by insufficient surveys, many speciemens in collections in the United States and the Philippines, including some that formed the basis for past publications, were mistakenly identified. This is not surprising, given the difficulties inherent in identifying many species, the lack of opportunity for comparison with type specimens, and the poor quality of some of early descriptions. However, it is a serious

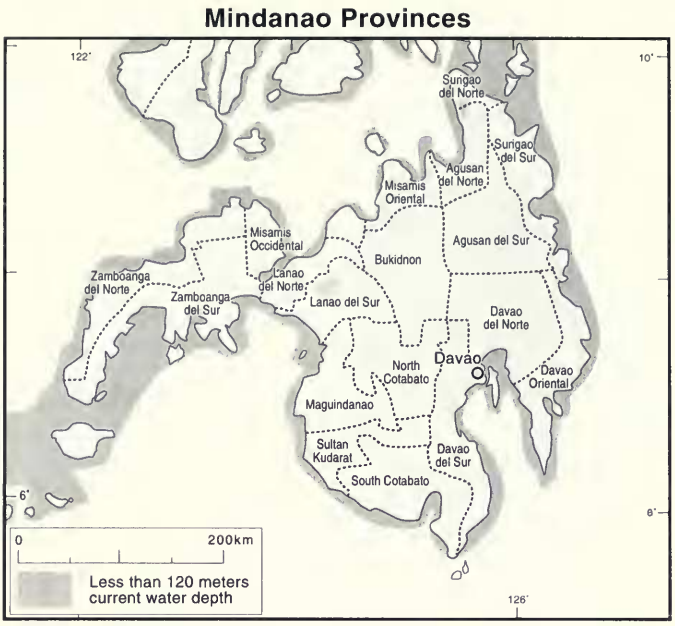

FIG. 3. Map of Mindanao showing the boundaries of provinces in 1995.

problem that requires very careful work in the future and skeptical review of earlier publications. We have taken a conservative approach to this problem in this synopsis: with few exceptions, we accept identifications only of those specimens that have been examined and identified unequivocally by the authors. Virtually all have been seen by the first author. The few exceptions involve species that are very poorly known, for which the published record forms virtually the only information available, or for some equivalent crucial reason. For each Philippine island or province listed in a species entry, we have indicated a single museum containing at least one specimen whose identification we have verified. Additional records from the same islands or provinces often are available in additional museums, but we cite only one. Museums are indicated by the following abbreviations:

AMNH—American Museum of Natural History, New York.

ANM—Australian National Museum, Sydney.

BMNH—Natural History Museum, London.

CUVC—Cornell University Vertebrate Collections, Ithaca.

DMNH—Delaware Museum of Natural History, Greenville.

FMNH—Field Museum of Natural History, Chicago.

FSM—Florida State Museum of Natural History, Gainesville.

MCZ—Museum of Comparative Zoology, Harvard University, Cambridge.

MMNH—Bell Museum of Natural History, University of Minnesota, St. Paul.

MSU–IIT—Mindanao State University–Iligan Institute of Technology, Iligan City.

PAWB—Protected Areas and Wildlife Bureau, Quezon City.

PNM—Philippine National Museum, Manila.

ROM—Royal Ontario Museum, Toronto.

SMF—Senckenberg Museum, Frankfurt.

SU—Museum of Natural History, Silliman University, Dumaguete.

SUML—Marine Laboratory, Silliman University, Dumaguete.

UIMNH—University of Illinois Museum of Natural History, Urbana.

UMMZ—University of Michigan Museum of Zoology, Ann Arbor.

UPD—Museum of Birds and Mammals, University of the Philippines at Diliman, Quezon City.

UPLB—Museum of Natural History, University of the Philippines at Los Banos, College.

USNM—United States National Museum of Natural History, Washington, D.C.

HABITAT—This section of each species account is a brief summary of the primary habitats utilized

by the species. In each case, we indicate the types of forest in which the species has been documented to occur, the elevational range, and the relative abundance in each of the major habitats, to the extent that these are known. Whenever possible, published sources are cited for the information, but we also relied heavily on our personal observations where these significantly supplemented published sources. These comments are based entirely on specimens we believe to be correctly identified.

The principal natural terrestrial habitats in the Philippines occur along elevational gradients, with lowland forest, montane forest, and mossy forest as the primary elements. The elevational range of the habitats varies among mountains based on peak elevation, topography, and annual rainfall. The habitats occur lower on low mountains, near the coast, and in areas with high rainfall and higher on mountains that have high peaks, are far from the shore, and are relatively dry. Lowland forest is dominated by species of the dipterocarp family; these trees often have large buttresses and often reach 40 m or more in height. Lowland forest ranges from sea level to 700 m on small, low-lying islands and to 1500 m on large, mountainous islands. Montane forest is not dominated by a single family of trees. It has trees that typically lack buttresses and reach 12 m to 30 m in height, and it occurs from 700 m to 1000 m on small, low-lying islands and from 1500 m to about 2300 m on large, mountainous islands. Mossy forest is characterized by short, gnarly trees (usually 3–8 m), by having moss covering most tree trunks and branches, and by having most ground surfaces covered by moss over a thick layer of humic soil. Conifers with low height but large girth (up to 2 m dbh) are found in some mossy forests. "Heath" vegetation, dominated by woody shrubs, often occurs on exposed ridges within mossy forest. Mossy forest occurs from as low as 1000 m (rarely 800 m) on small islands (at the peaks) and from 2100 m and above on the highest mountains. For a given mountain range, the elevation of these types of forest may overlap, and there is always a fairly gradual transition between them. Note that for some species of mammals we know only the elevational range, not the actual habitat in which the species occurred.

We use "primary forest" to refer to forest that has not been disturbed significantly by major human activities such as logging. "Secondary forests" have been disturbed, often heavily, usually by logging or burning; they range from well-regenerated second growth of natural forests, to planted forests of exotic species, to scrubby areas with scattered trees. We use "agricultural areas" to refer to a range of habitats, from coconut palm plantations to mixed pasture, fields, and orchards, and varying densities of human habitation.

STATUS—This section provides a brief statement of the conservation status of each species based on published information and our personal observations. For each species, we indicate our best estimate of the general stability of the species's population(s), abundance, and degree of vulnerability to known threats (especially habitat destruction and hunting). Where the information is available, we indicate how a species's present status differs from that in the past (Gonzales & Alcala, 1969; Rabor, 1966, 1968).

We use the following terms to describe relative abundance, in order of increasing abundance: extinct, rare, uncommon, moderately common, common, and abundant. "Endemic" refers to a species that is restricted to a defined area; thus, a species might be said to be endemic to Camiguin Island, which means that it is found nowhere else. More generally, such a species could also be said to be endemic to the Philippines. "Native" species occur naturally in the Philippines; all endemic species are native, but not all native species are endemic. For example, the palm civet (*Paradoxurus hermaphroditus*) is native to the Philippines, but it is also present in much of South and Southeast Asia. "Non-native" (also called "exotic") species are those that do not occur naturally in the Philippines; rather, they have been introduced into the Philippines by humans, often accidentally, such as the rats and mice that arrived on ships. "Commensal" species are those that are often (but not always) closely associated with human settlements. These commensal species often live in human houses and other buildings; except for a few species of bats, all such species in the Philippines are non-native. All marine mammals listed here are native to the Philippines, but none are endemic.

OFFICIAL/LEGAL STATUS—Many of the species listed herein are included in various official listings of species of conservation concern and/or protected status under national or international agreement. These include CITES (Convention on International Trade in Endangered Species), IUCN (International Union for the Conservation of Nature), and U.S. ESA (United States Endangered Species Act). We include reference to all of these listings in this synopsis, current through De-

cember 1996; as more is learned about the conservation status of the mammals of the Philippines, many more species will be added to these lists.

Users of this synopsis should be aware that the intent and coverage of each of these lists varies greatly. Coverage by the U.S. ESA is especially limited with respect to Philippine species, because the U.S. ESA deals primarily (but not exclusively) with species in the United States and its territories. Species are listed by CITES only if it is believed that these species are threatened by international trade. It should be noted that CITES lists some species that are moderately common in the wild but are believed to be highly vulnerable if trade were to be unrestricted, such as African elephants. On the other hand, CITES does not list many species that are seriously endangered, because they are not believed to be threatened by international trade. Even species that are threatened by local trade are not included by CITES if there is no international trade. Additionally, CITES lists species that are common if there is reason to believe that an endangered species might be misidentified as that species (thus increasing the likelihood of trade); for example, all species of *Pteropus* are listed by CITES because several species are endangered as a result of international trade and most species are quite similar in appearance. In short, CITES listing is really not a threatened species status category at all, but a regulatory mechanism for international trade. U.S. ESA listing are also potentially misleading, but for different reasons. Both CITES and U.S. ESA listings are often inconsistent with IUCN listings, and they can be positively misleading if misunderstood.

The IUCN Red List (Baillie & Groombridge, 1996) is the most comprehensive and consistent of all of these listings; it is intended to cover all parts of the world and all groups of mammals (as well as other taxa) equally. However, it too is limited. In the past, attention was often focused on large and attractive ("charismatic") animals, because these were often the only species for which adequate information was available; only in the 1996 list are smaller species given equal attention. However, even the 1996 list has limitations. First, data are often lacking on the conservation status (and basic ecology) of small mammals in the tropics. Second, incorrect information in past lists has sometimes been carried over (such as the listing of *Podogymnura truei,* which is probably not threatened, as discussed below). Third, the IUCN does not include species that have been discovered but have not yet been formally described. In the case of the Philippines, where 14 species are currently in the process of being described (as listed below), this constitutes a major portion of the fauna.

Finally, it should be noted that the Philippines is one of the first countries in the tropics to have its own Red Data Book (Wildlife Conservation Society of the Philippines, 1997). The mammal section in that book was taken largely from an earlier draft of this paper and represents an effort to present a comprehensive statement of current knowledge about the conservation status of the various species. However, as noted in that volume and in this paper, information on many species is very incomplete, and neither publication should be taken as more than one step in the process of acquiring the needed data.

A NOTE ON AUTHORSHIP—The bulk of this paper was written by the first two authors, with the exception of the sections on marine mammals, which were written principally by M. L. Dolar. Other authors reviewed the manuscript, made available unpublished notes, and/or made available specimens in collections they care for. All authors reviewed the manuscript and worked to develop a consensus on the many issues that are summarized here.

Insectivora

Erinaceidae—Hedgehogs and Gymnures

The only two species of the genus *Podogymnura* (Fig. 4A) are confined to the Philippines (Poduschka & Poduschka, 1985).

Podogymnura aureospinula Heaney and Morgan, 1982. Proc. Biol. Soc. Washington, 95:14.

COMMON NAME—Dinagat gymnure, Dinagat wood shrew.

DISTRIBUTION—Endemic to the Philippines; restricted to Dinagat Island (DMNH).

HABITAT—Occurs in forest (Heaney & Rabor, 1982; Tabaranza, unpubl. data).

STATUS—Moderately common in primary and secondary forest on Dinagat, but geographically restricted to an island where habitat destruction

has been extensive (Heaney & Morgan, 1982; Heaney & Utzurrum, 1991; Tabaranza, unpubl. data). IUCN: Endangered.

Podogymnura truei Mearns, 1905. Proc. U.S. Natl. Mus., 28:437.

COMMON NAME—Mindanao gymnure, Mindanao wood shrew.

DISTRIBUTION—Endemic to the Philippines; restricted to Mindanao Island (Bukidnon [FMNH], Davao del Norte [FMNH], and Davao del Sur [FMNH] provinces).

HABITAT—Widespread on Mindanao in primary forest above 1300 m (Musser & Heaney, 1992), common in montane forest, ca. 1600 m to 2000 m, and abundant in mossy forest, 2000 m to 2900 m (Hoogstraal, 1951; Poduschka & Poduschka, 1985; Sanborn, 1952; Rabor, 1986; Heaney et al., unpubl. data).

STATUS—Because of its occurrence in high-elevation forest of low stature that has limited commercial value and its abundance, current populations of this species are stable. For these reasons, we disagree with the IUCN listing, and we recommend that it be listed as nonthreatened (Heaney et al., 1997). IUCN: Vulnerable (but we recommend delisting).

Soricidae—Shrews

Systematics, genetic variation, and phylogenetic variation in Philippine shrews were studied by Heaney and Ruedi (1994). Six of the eight species are endemic, one is widespread elsewhere in Asia, and one is a non-native species that often lives in and near houses and occasionally in primary forest. A representative species is shown in Figure 4F.

Crocidura attenuata Milne-Edwards, 1872. Rech. Hist. Nat. Mamm., p. 263.

COMMON NAME—Indochinese shrew.

DISTRIBUTION—Widespread on Asian continent and many associated shallow-water islands. In the Philippines, known only from Batan Island, Batanes Province (USNM; Heaney & Ruedi, 1994).

HABITAT—Common and widespread in Asia; its ecology unknown in the Batanes group of islands.

STATUS—Abundant and stable in continental Asia but unknown in the Batanes group.

Crocidura beatus Miller, 1910. Proc. U.S. Natl. Mus., 38:392.

COMMON NAME—Common Mindanao shrew.

DISTRIBUTION—Endemic to the Philippines; widespread in Mindanao Faunal Region and on Camiguin. Recorded from Biliran (USNM), Bohol (USNM), Camiguin (FMNH), Leyte (USNM), Maripipi (UMMZ), and Mindanao (Agusan [DMNH], Bukidnon [FMNH], South Cotabato [UIMNH], Misamis Occidental [FMNH], and Zamboanga del Sur [FMNH] provinces) (Heaney & Ruedi, 1994).

HABITAT—Common in primary forest, especially at higher elevations; uncommon in secondary forest, and absent outside of forest (Heaney et al., 1989; Heaney & Tabaranza, 1995; Rickart et al., 1993).

STATUS—Widespread and locally abundant, stable. IUCN: Vulnerable (but we recommend delisting).

COMMENT—Includes *C. parvacauda* (Heaney & Ruedi, 1994).

Crocidura grandis Miller, 1910. Proc. U.S. Natl. Mus., 38:393.

COMMON NAME—Greater Mindanao shrew.

DISTRIBUTION—Endemic to the Philippines; restricted to Mindanao Island (Misamis Occidental Province). Known only from a single specimen (USNM) taken in 1906 at 6100 ft. on Mt. Malindang (Heaney & Ruedi, 1994).

HABITAT—Unknown; probably confined to primary forest.

STATUS—Unknown; no attempt has been made to assess the status in the area of the type locality. The lack of specimens from the highest peaks on Mindanao, Mt. Apo (Sanborn, 1952) and Mt. Kitanglad (Heaney et al., unpubl. data), may indicate that the species is confined to the Zamboanga Peninsula and perhaps to Mt. Malindang, the highest point on the peninsula. Deforestation has been extensive throughout this region. Probably vulnerable; surveys are needed. IUCN: Endangered.

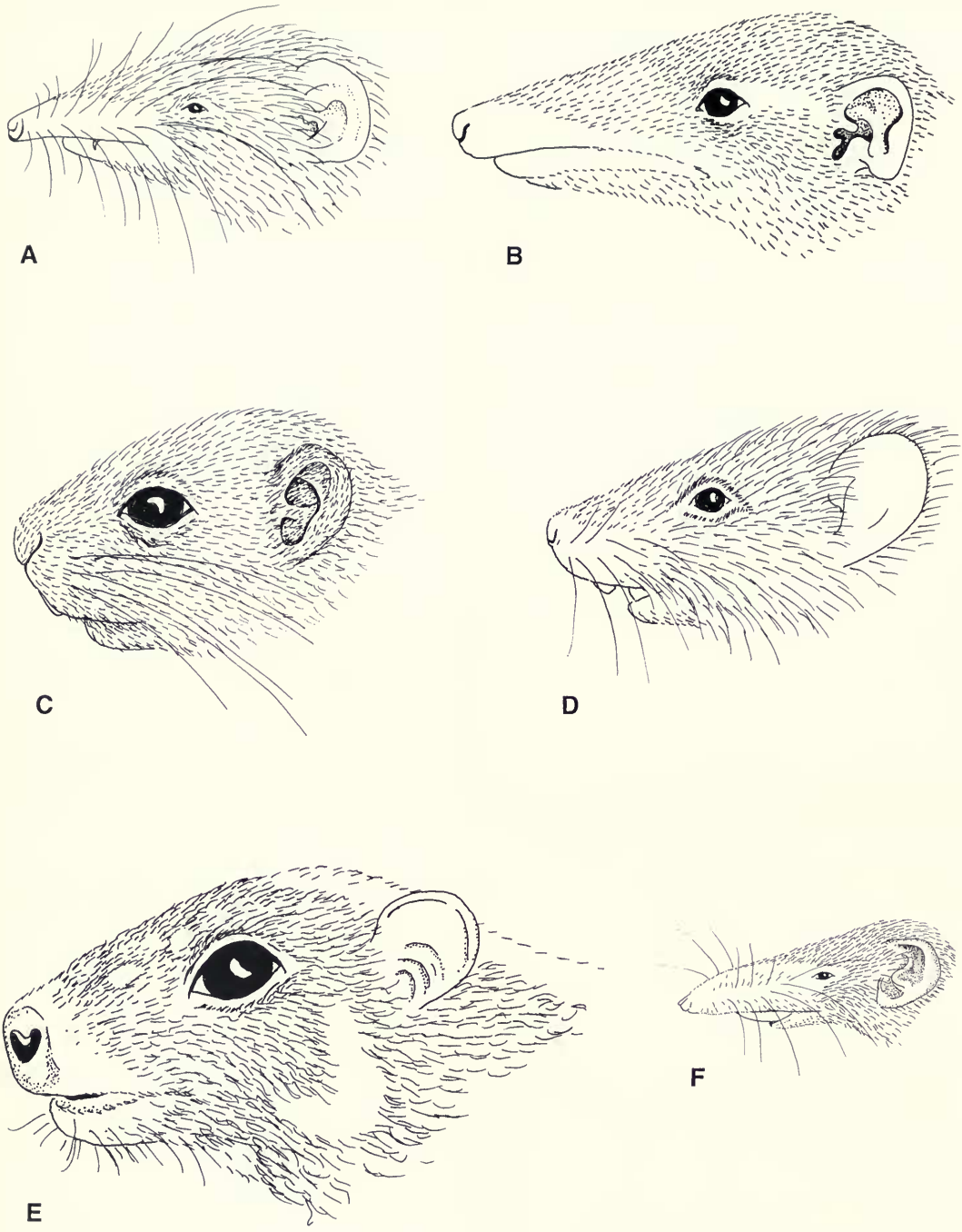

FIG. 4. Heads of representative mammals from Mindanao (not to the same scale). **A,** *Podogymnura truei* (Family Erinaceidae). **B,** *Urogale everetti* (Family Tupaiidae). **C,** *Sundasciurus philippinensis* (Family Sciuridae). **D,** *Batomys salomonseni* (Family Muridae). **E,** *Cynocephalus volans* (Family Cynocephalidae). **F,** *Crocidura beatus* (Family Soricidae).

Crocidura grayi Dobson, 1890. Ann. Mag. Nat. Hist., ser. 6. 6:494.

COMMON NAME—Luzon shrew.

DISTRIBUTION—Philippines only; widespread in Luzon and Mindoro faunal regions. Recorded from Catanduanes (USNM), Luzon (Aurora [UPD], Benguet [USNM], Camarines Sur [FMNH], Laguna [BMNH], Mountain [BMNH], and Rizal [AMNH] provinces), and Mindoro (MMNH). Also reported from Abra Province, Luzon (Lawrence, 1939).

HABITAT—Common in primary lowland, montane, and mossy forest from 250 m to 2400 m, uncommon in secondary forest (Heaney et al., 1991, in press; Rickart et al., 1991).

STATUS—Stable; widespread and common. IUCN: Vulnerable (but we recommend delisting).

COMMENT—Includes *C. halconus* as a junior synonym (Heaney & Ruedi, 1994).

Crocidura mindorus Miller, 1910. Proc. U.S. Natl. Mus., 38:392.

COMMON NAME—Mindoro shrew.

DISTRIBUTION—Philippines only; endemic to Mindoro (USNM) and Sibuyan (FMNH) islands (Heaney & Ruedi, 1994).

HABITAT—On Mindoro, taken only in high-elevation primary forest; on Sibuyan, uncommon in forest from 325 m to 1325 m.

STATUS—Known on Mindoro only from two specimens taken in 1906 at 6300 ft. elevation on Mt. Halcon, and on Sibuyan from six specimens taken in 1989 and 1992 (Goodman & Ingle, 1993; Goodman & Heaney, unpubl. data). Mindoro and Sibuyan have undergone extensive deforestation. Probably vulnerable; surveys are needed. IUCN: Endangered.

Crocidura negrina Rabor, 1952. Chicago Acad. Sci. Nat. Hist. Misc., 96:6.

COMMON NAME—Negros shrew.

DISTRIBUTION—Philippines only; endemic to Negros Island (FMNH).

HABITAT—Known only from six specimens taken in primary lowland and montane forest from ca. 500 m to 1450 m elevation in southern Negros (UMMZ) (Heaney & Ruedi, 1994; Heaney & Utzurrum, 1991; Rabor, 1986).

STATUS—Rare because of restricted range and habitat destruction (Heaney & Utzurrum, 1991). IUCN: Critically endangered.

Crocidura palawanensis Taylor, 1934. Monogr. Bur. Sci. Manila, 30:88.

COMMON NAME—Palawan shrew.

DISTRIBUTION—Endemic to the Palawan Faunal Region. Records are from Palawan (FMNH) and Balabac (USNM) islands.

HABITAT—The holoytpe was taken "in deep forest near the sea" (Taylor, 1934). Also taken in shrubby second growth at ca. 400 m (Hoogstraal, 1951). The closely related *C. fuliginosa* and *C. baluensis* occur in forest over a broad elevational range (Payne et al., 1985).

STATUS—Unknown; geographically restricted to an area undergoing rapid deforestation. Surveys are needed. IUCN: Vulnerable.

Suncus murinus (Linnaeus, 1766). Syst. Nat., 12th ed., 1:174.

COMMON NAME—Asian house shrew.

DISTRIBUTION—Asia and Indo-Australia; throughout the Philippines. Specimens from Camiguin (DMNH), Leyte (USNM), Luzon (Batangas [USNM], Cagayan [UPLB], Camarines Sur [UPD], Ilocos Norte [USNM], Isabela [USNM], Laguna [USNM], La Union [USNM], Pampanga [USNM], Pangasinan [USNM], Rizal [USNM], and Zambales [USNM] provinces), Marinduque (PNM), Mindanao (Misamis Oriental [UPLB] province), Negros (USNM), Panay (USNM), and Siquijor (SU). Also reported from Caluya Island (Alcala & Alviola, 1970).

HABITAT—Abundant in urban and agricultural areas (Rabor, 1977, 1986), often in disturbed forest, occasionally in primary forest; found from sea level to 1650 m on Negros (Heaney et al., 1989; Heaney et al, in press; Rickart et al., 1993).

STATUS—Non-native. Abundant and stable.

COMMENT—Includes *Crocidura edwardsiana* (Heaney & Ruedi, 1994).

Scandentia

Tupaiidae—Tree Shrews

This family contains only two Philippine species; a representative is shown in Figure 4B.

Tupaia palawanensis Thomas, 1894. Ann. Mag. Nat. Hist., ser. 6, 9:251.

COMMON NAME—Palawan tree shrew.

DISTRIBUTION—Endemic to Palawan Faunal Region; recorded from Balabac (USNM), Busuanga (FMNH), Culion (FMNH), Cuyo (FMNH), and Palawan (FMNH).

HABITAT—Common in secondary and primary forest, coconut groves, bamboo thickets, and banana plantations (Dans, 1993; Hoogstraal, 1951; Sanborn, 1952) at "low to medium elevation" (Rabor, 1986).

STATUS—Common and stable. IUCN: Vulnerable (but we recommend delisting).

COMMENT—Included in *T. glis* by Corbet and Hill (1992) but not by Wilson (1993).

Urogale everetti (Thomas, 1892). Ann. Mag. Nat. Hist., ser. 6, 9:250.

COMMON NAME—Mindanao tree shrew.

DISTRIBUTION—Philippines only; endemic to the Mindanao Faunal Region. Recorded from Dinagat (DMNH), Mindanao (Bukidnon [FMNH], Davao del Sur [FMNH], Misamis Occidental [FMNH], Misamis Oriental [FMNH], South Cotabato [AMNH], Surigao del Norte [DMNH], and Zamboanga del Sur [USNM] provinces), and Siargao (DMNH).

HABITAT—Scarce to common in primary forest from 750 m to 2250 m (Musser & Heaney, 1992; Sanborn, 1952; Heaney et al., unpubl. data).

STATUS—Widespread and locally common in forest on Dinagat and Mindanao, but dependent on lowland forest that has been largely destroyed. IUCN: Vulnerable. CITES: Appendix II.

Dermoptera

Cynocephalidae—Flying Lemurs

The order Dermoptera includes a single family, and that family has only two species, one of which occurs in the Philippines and the other in Malaysia and western Indonesia. The appearance of the head is shown in Figure 4E.

Cynocephalus volans (Linnaeus, 1758). Syst. Nat., 10th ed., 1:30.

COMMON NAME—Kagwang, Philippine flying lemur.

DISTRIBUTION—Philippines only; endemic to the Mindanao Faunal Region. Recorded from Basilan (AMNH), Biliran (USNM), Bohol (FMNH), Dinagat (USNM), Leyte (USNM), Mindanao (Agusan del Norte [UPLB], Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Lanao del Norte [USNM], Lanao del Sur [DMNH], Misamis Occidental [FMNH], Misamis Oriental [DMNH], South Cotabato [FMNH], Surigao del Sur [UPLB], Zamboanga del Norte [FMNH], and Zamboanga del Sur [DMNH] provinces), Samar (FMNH), and Siargao (DMNH). Also reported from Maripipi (Rickart et al., 1993).

HABITAT—Common in primary and secondary forest, and in mixed forest and orchard, from sea level to ca. 500 m elevation on small islands, up to ca. 1100 m on Mindanao (Rabor, 1986; Rickart et al., 1993; Wischusen et al., 1992, 1994; Wischusen & Richmond, 1989; Heaney et al., unpubl. data).

STATUS—Widespread and common, populations are stable. Widespread destruction of lowland forest makes them somewhat vulnerable, but their ability to persist in disturbed forest makes them more resilient than many species. IUCN: Vulnerable (although current data do not support this listing).

Chiroptera

Pteropodidae—Fruit Bats

The number of fruit bats known from the Philippines has increased from 23 to 25, with the addition of as yet undescribed species of *Haplonycteris* from Sibuyan and *Pteropus* from Mindoro and the new record of *Pteropus dasymallus* from the Babuyan Islands, along with the inclusion of *Acerodon lucifer* as a synonym of *Acerodon jubatus* (as discussed below). Distribution patterns were analyzed by Heaney (1991b), Heaney and Rickart (1990), and Koopman (1989), feeding ecology by Utzurrum (1995), and chromosomes by Rickart et al. (1989a). The appearance of a representative species is shown in Figure 5A.

Acerodon jubatus (Eschscholtz, 1831). Zool. Atlas, part 4:1.

COMMON NAME—Golden-crowned flying fox.

DISTRIBUTION—Endemic to the Philippines;

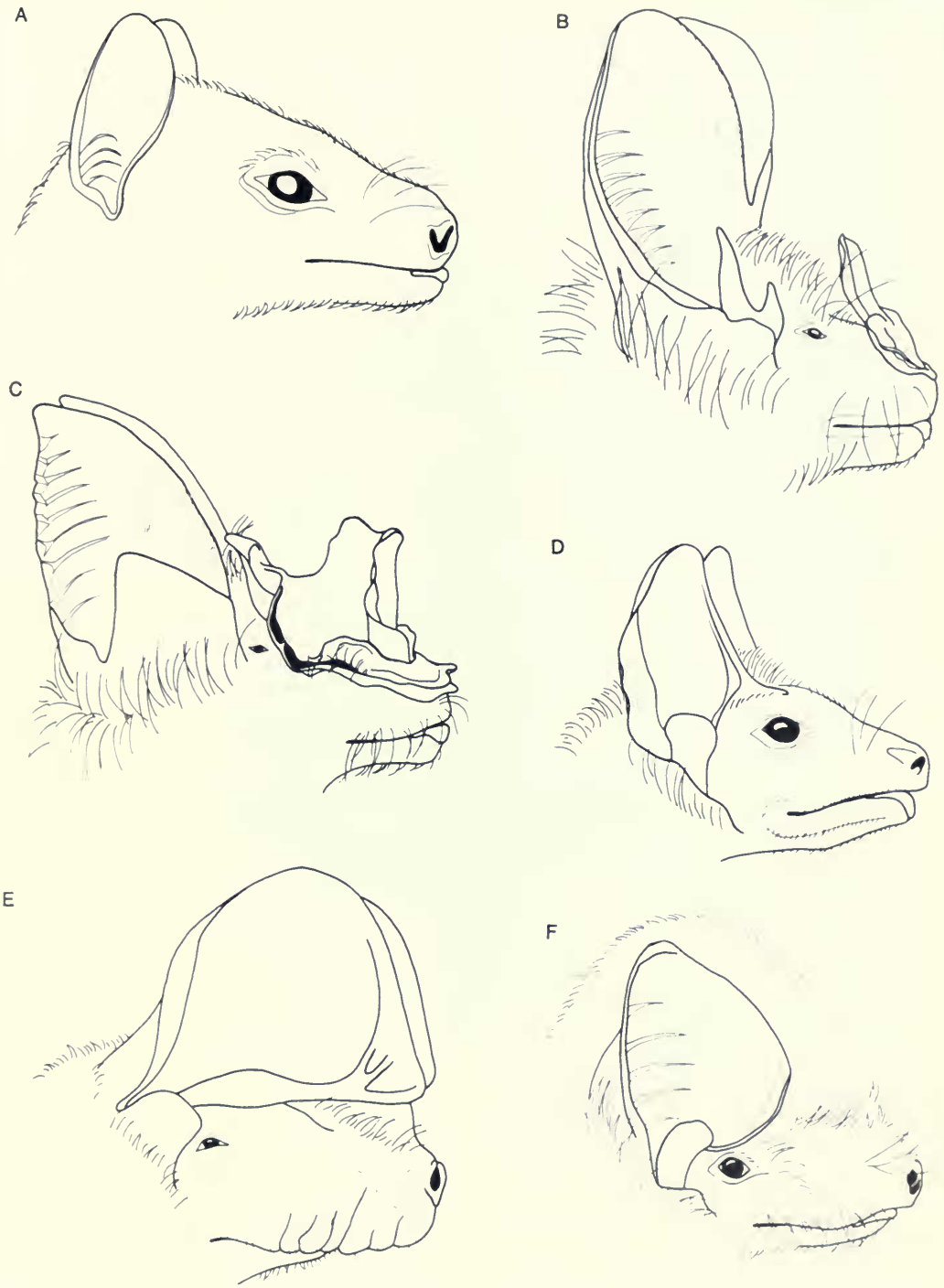

FIG. 5. Heads of representative Philippine bats (not to the same scale). **A**, *Rousettus amplexicaudatus* (Family Pteropodidae). **B**, *Megaderma spasma* (Family Megadermatidae). **C**, *Rhinolophus* sp. (Family Rhinolophidae). **D**, *Taphozous melanopogon* (Family Emballonuridae). **E**, *Chaerophon plicata* (Family Molossidae). **F**, *Miniopterus schreibersii* (Family Vespertillionidae). From Ingle and Heaney (1992).

widespread with the exception of the Palawan Faunal Region and the Batanes and Babuyan groups. Recorded from Basilan (MCZ), Bongao (AMNH), Cabo (USNM), Bohol (FMNH), Dinagat (DMNH), Jolo (FMNH), Leyte (FMNH), Luzon (Abra [MCZ], Isabela [AMNH], Quezon [USNM], Rizal [AMNH], and Tarlac [USNM] provinces), Marinduque (UPD), Maripipi (USNM), Mindanao (Davao del Norte [FMNH], Davao del Sur [FMNH], Lanao del Norte [DMNH], Lanao del Sur [DMNH], Maguindanao [FMNH], Misamis Oriental [DMNH], South Cotabato [USNM], Sultan Kudarat [AMNH], Surigao del Sur [DMNH], Zamboanga del Norte [FMNH], and Zamboanga del Sur [AMNH] provinces), Mindoro (USNM), Negros (FMNH), Panay (FMNH), Sibutu (DMNH), and Siquijor (FMNH).

HABITAT—Primary and secondary lowland forest up to 1100 m. Some roosts reported from mangrove and on small islands (Hoogstraal, 1951; Rabor, 1986). Common reports of 100,000 individuals in a colony from the late 1800s and early 1900s contrast with recent observations of maximum colony size of 5,000 and usually far fewer (Heaney & Heideman, 1987; Heaney & Utzurrum, 1991; Lawrence, 1939; Mickleburgh et al., 1992; Mudar & Allen, 1986; Rickart et al., 1993; Taylor, 1934; Utzurrum, 1992).

STATUS—Severely declining as a result of habitat destruction and heavy hunting. IUCN: Endangered. CITES: Appendix II.

COMMENT—Includes the Panay golden-crowned flying fox (*Acerodon lucifer* Elliot, 1896). Examination of all known extant specimens of *A. lucifer* has shown that there are no morphological differences that distinguish the two supposed species (Ingle & Heaney, 1992; Heaney, unpubl. data). Specimens from Panay show the greatest resemblance to those from Negros. The Panay population, which formerly occurred in large colonies, was presumed extinct (Elliot, 1896; Heaney & Heideman, 1987; Mickleburgh et al., 1992; Utzurrum, 1992), but recent sightings on Boracay (Maro & Ingle, unpubl. data) may represent this species. Possibly extinct on Siquijor (Lepiten, 1995).

Acerodon leucotis (Sanborn, 1950). Proc. Biol. Soc. Washington, 63:189.

COMMON NAME—Palawan flying fox.

DISTRIBUTION—Philippines only; endemic to the Palawan Faunal Region. Recorded from Balabac (USNM), Busuanga (FMNH), and Palawan (FMNH) islands.

HABITAT—Uncertain, but probably moderately common in primary and secondary forest (Hoogstraal, 1951).

STATUS—No current information. IUCN: Vulnerable. CITES: Appendix II.

COMMENT—Formerly placed in the genus *Pteropus* (Musser et al., 1982).

Alionycteris paucidentata Kock, 1969. Senckenberg. Biol., 50:322.

COMMON NAME—Mindanao pygmy fruit bat.

DISTRIBUTION—Philippines only; endemic to Mindanao Island (Bukidnon Province [FMNH]).

HABITAT—Known only from primary forest on Mt. Kitanglad, Bukidnon Province. Absent in lowland forest. Uncommon in montane forest from 1600 m to 1900 m, common in mossy forest at 2250 m (and probably above; Heaney et al., unpubl. data).

STATUS—Common in appropriate high-elevation habitat; geographically restricted. IUCN: Vulnerable.

Cynopterus brachyotis (Müller, 1838). Tijdschr. Nat. Gesch. Physiol., 5:146.

COMMON NAME—Common short-nosed fruit bat.

DISTRIBUTION—Southeast Asia; throughout the Philippines. Specimens from Balabac (FMNH), Barit (FMNH), Basilan (UMMZ), Batan (USNM), Batu-bato (DMNH), Biliran (USNM), Bohol (USNM), Bongao (DMNH), Busuanga (FMNH), Calauit (UMMZ), Camiguin (FMNH), Catanduanes (FMNH), Cebu (FMNH), Culion (FMNH), Cuyo (FMNH), Dalupiri (FMNH), Dinagat (USNM), Fuga (FMNH), Guimaras (UMMZ), Leyte (USNM), Luzon (Albay [FMNH], Aurora [UPD], Bulacan [USNM], Cagayan [UMMZ], Camarines Sur [FMNH], Isabela [FMNH], Laguna [USNM], Quezon [UMMZ], Rizal [UPD], Sorsogon [FMNH], Tarlac [MCZ, USNM], and Zambales [USNM] provinces), Marinduque (PNM), Maripipi (USNM), Marsec (USNM), Masbate (SU), Mindanao (Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Davao Oriental [UPLB], Lanao del Norte [DMNH], Misamis Oriental [DMNH], South Cotabato [AMNH], Zamboanga del Norte [UPLB], and Zamboanga del Sur [DMNH] provinces), Mindoro (FMNH), Negros (FMNH), Palawan

(FMNH), Panabulon (UMMZ), Panay (SU), Polillo (FMNH), Sabtang (USNM), Sanga-sanga (DMNH), Siargao (DMNH), Sibutu (DMNH), Sibuyan (FMNH), Simunol (DMNH), Siquijor (FMNH), and Tablas (SU). Also reported from Caluya, Sibay, Semirara, Boracay, and Carabao islands (Alcala & Alviola, 1970).

HABITAT—Ranges from sea level to at least 1250 m. Abundant in agricultural areas, common in secondary forest, usually uncommon or absent in primary forest (Heaney et al., 1989, 1991, in press; Heideman & Heaney, 1989; Ingle, 1992; Lepiten, 1995; Rickart et al., 1993).

STATUS—Abundant and geographically widespread; stable.

COMMENT—Kitchener and Maharadatunkamsi (1991) and Schmitt et al. (1995) considered populations of this species from the Philippines and Sulawesi to represent a separate species, *C. luzoniensis*, but Corbet and Hill (1992) and Koopman (1993) place *C. luzoniensis* as a subspecies of *C. brachyotis*; further study is needed.

Dobsonia chapmani Rabor, 1952. Chicago Acad. Sci. Nat. Hist. Misc., 96:2.

COMMON NAME—Negros naked-backed fruit bat.

DISTRIBUTION—Philippines only; endemic to Negros (FMNH) and Cebu (DMNH) islands.

HABITAT—Formerly common in lowland forest from sea level to 800 m in southern Negros Island, where it roosted exclusively in caves (Heaney & Heideman, 1987; Rabor, 1986; Utzurrum, 1992).

STATUS—Believed to have become extinct in 1970s as a result of the combination of forest destruction, disturbance by guano miners, and hunting (Heaney & Heideman, 1987; Utzurrum, 1992).

COMMENT—Considered to be conspecific with *D. exoleta* by Corbet and Hill (1992) but not by Koopman (1993).

Dyacopterus spadiceus (Thomas, 1890). Ann. Mag. Nat. Hist., ser. 6, 5:235.

COMMON NAME—Dayak fruit bat.

DISTRIBUTION—Sumatra and the Malay Peninsula; in the Philippines, known from one specimen from Luzon (Abra province, SMF) and one from Mindanao (Misamis Oriental province, DMNH) (Kock, 1969a; Utzurrum, 1992).

HABITAT—Unknown in the Philippines. On Borneo, believed to roost in hollow trees and caves (Payne et al., 1985).

STATUS—Unknown.

Eonycteris robusta Miller, 1913. Proc. Biol. Soc. Washington, 26:73.

COMMON NAME—Philippine nectar bat, Philippine dawn bat.

DISTRIBUTION—Endemic to the Philippines; widespread but absent from Palawan Faunal Region and the Batanes/Babuyan group of islands. Recorded from Biliran (UMMZ), Catanduanes (USNM), Leyte (DMNH), Lubang (MCZ), Luzon (Abra [MCZ], Cavite [UMMZ], Mountain [MCZ], and Rizal [USNM] provinces), Marinduque (PNM), Maripipi (UMMZ), Mindanao (Bukidnon [FMNH], Lanao del Norte [UPLB], Maguindanao [FMNH], Misamis Oriental [DMNH], and Zamboanga del Sur [DMNH] provinces), Negros (USNM), and Siargao (DMNH).

HABITAT—Until the 1960s, commonly taken in caves adjacent to forest and commonly netted in and adjacent to primary forest from sea level to 1100 m, often in areas with mixed forest and clearings, but never in primarily agricultural areas.

STATUS—Captured rarely in the 1980s and 1990s and may now be quite rare (Heaney et al., 1991; Mickleburgh et al., 1992; Utzurrum, 1992).

COMMENT—Usually included as a subspecies of *E. major* (Corbet & Hill, 1992; Koopman, 1993), but we believe that it is distinct (Heaney, unpubl. data).

Eonycteris spelaea (Dobson, 1871). Proc. Asiat. Soc. Bengal, p. 105, 106.

COMMON NAME—Common nectar bat, common dawn bat.

DISTRIBUTION—India to Timor; throughout the Philippines except the Batanes/Babuyan region. Recorded from Biliran (UMMZ), Bohol (USNM), Catanduanes (USNM), Cebu (UPLB), Leyte (USNM), Luzon (Abra [MCZ], Cavite [MCZ], Ilocos Norte [USNM], Laguna [UPLB], Pampanga [USNM], Rizal [MCZ], and Sorsogon [FMNH] provinces), Marinduque (MCZ), Maripipi (UMMZ), Masbate (SU), Mindanao (Agusan del Norte [SU], Davao del Sur [FMNH], Davao Oriental [DMNH], Lanao del Norte

[DMNH], Misamis Oriental [DMNH], South Cotabato [DMNH], Surigao del Norte [SU], and Zamboanga del Sur [DMNH] provinces), Mindoro (MCZ), Negros (FMNH), Palawan (FMNH), Polillo (FMNH), Sanga-sanga (DMNH), Satang (UPLB), Siargao (DMNH), Sibuyan (FMNH), Siquijor (SU), and Tablas (SU). Also reported from Carabao Island (Alcala & Alviola, 1970).

HABITAT—Common in agricultural areas from sea level to 1100 m, often at high densities (Heaney et al., 1989, in press; Heideman & Heaney, 1989; Lepiten, 1995; Rickart et al., 1993). Known to roost only in caves, where they form colonies of up to thousands of individuals, and where they are vulnerable to hunting pressure (Rickart et al., 1993; Utzurrum, 1992).

STATUS—Stable and common in agricultural areas but heavily hunted and vulnerable.

Haplonycteris fischeri Lawrence, 1939. Bull. Mus. Comp. Zool., 86:33.

COMMON NAME—Philippine pygmy fruit bat.

DISTRIBUTION—Endemic to the Philippines; widespread excluding the Camiguin, Palawan, Batanes/Babuyan, and Sibuyan Faunal Regions. Recorded from Biliran (USNM), Bohol (USNM), Catanduanes (FMNH), Dinagat (USNM), Leyte (USNM), Luzon (Aurora [UPD], Cagayan [UMMZ], Camarines Sur [USNM], Isabela [AMNH], Laguna [UPLB], Quezon [UMMZ], and Tarlac [USNM] provinces), Marinduque (UPD), Mindanao (Agusan del Norte [UMMZ], Bukidnon [FMNH], Davao del Norte [UPLB], Davao del Sur [UPLB], Davao Oriental [UPLB], Misamis Occidental [UPLB], Misamis Oriental [UPLB], South Cotabato [UPLB], Surigao del Norte [UPLB], Surigao del Sur [UPLB], Zamboanga del Norte [UPLB], and Zamboanga del Sur [DMNH] provinces), Mindoro (FMNH), Negros (FMNH), and Panay (SU). The record from Palawan reported by Kock (1969b) probably is erroneous.

HABITAT—One of the most common fruit bats in primary forest, especially at middle elevations. It is rare in secondary forest and absent in entirely agricultural areas. Within forest, it occurs from about 150 m to 2250 m; abundance usually increases with elevation up to about 1200 m to 1500 m and then declines (Heaney et al., 1989, 1991, in press; Heideman & Heaney, 1989; Rickart et al., 1993).

STATUS—Currently stable, but it has declined in recent decades as a result of habitat destruction by logging. IUCN: Vulnerable (but we recommend delisting).

COMMENT—Genetic variation was studied by Peterson and Heaney (1993) and reproductive biology by Heideman (1989).

Haplonycteris sp. A

COMMON NAME—Sibuyan pygmy fruit bat.

DISTRIBUTION—Philippines only; endemic to Sibuyan Island (FMNH; Goodman & Ingle, 1993).

HABITAT—Found in primary forest from near sea level to 1325 m on Sibuyan Island, not known from outside of primary forest (Goodman & Ingle, 1993).

STATUS—Geographically restricted and subject to pressure from deforestation (Goodman & Ingle, 1993).

COMMENT—Genetically distinct from *H. fischeri* (Peterson & Heaney, 1993) and currently being described by Goodman and Heaney.

Harpyionycteris whiteheadi Thomas, 1896. Ann. Mag. Nat. Hist., ser. 6, 18: 244.

COMMON NAME—Harpy fruit bat.

DISTRIBUTION—Philippines only, where it is widespread, excluding the Palawan Faunal Region and the Batanes/Babuyan group of islands. Recorded from Biliran (USNM), Camiguin (FMNH), Leyte (USNM), Luzon (Camarines Sur [USNM]), Marinduque (UPD), Maripipi (UMMZ), Masbate (SU), Mindanao (Agusan del Norte [SU], Bukidnon [FMNH], Davao Oriental [FMNH], Lanao del Norte [DMNH], Lanao del Sur [DMNH], Misamis Oriental [DMNH], South Cotabato [DMNH], and Zamboanga del Norte [DMNH] provinces), Mindoro (BMNH), Negros (FMNH), and Samar (PNM).

HABITAT—Restricted to primary or lightly disturbed forest. Rare in lowland forest and moderately common in montane forest to at least 1800 m. It may depend on the fruits of viney pandans (*Freycinetia* spp.; Heaney, 1984; Heaney et al., 1989; Heideman & Heaney, 1989; Rickart et al., 1993).

STATUS—Populations currently stable because of their use of montane forest, which is mostly intact. Vulnerable to deforestation.

Macroglossus minimus (É. Geoffroy, 1810). Ann. Mus. Hist. Nat. Paris, 15:97.

COMMON NAME—Dagger-toothed flower bat, lesser long-tongued fruit bat.

DISTRIBUTION—Thailand to Australia; throughout the Philippines. Recorded from Batu-bato (DMNH), Biliran (USNM), Bohol (USNM), Busuanga (USNM), Cagayan de Sulu (USNM), Calauit (UMMZ), Camiguin (FMNH), Catanduanes (FMNH), Cebu (AMNH), Dinagat (USNM), Leyte (USNM), Luzon (Albay [FMNH], Aurora [UPD], Cagayan [UMMZ], Camarines Norte [UPD], Camarines Sur [USNM], Isabela [FMNH], Laguna [AMNH], Quezon [UMMZ], Rizal [UPD], Sorsogon [FMNH], and Tarlac [USNM] provinces), Marinduque (PNM), Maripipi (USNM), Masbate (SU), Mindanao (Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Davao Oriental [DMNH], Lanao del Norte [DMNH], Lanao del Sur [DMNH], Misamis Oriental [DMNH], South Cotabato [AMNH], and Zamboanga del Sur [DMNH] provinces), Mindoro (FMNH), Negros (FMNH), Palawan (USNM), Panay (SU), Polillo (FMNH), Reinard (USNM), Sanga-sanga (DMNH), Siargao (DMNH), Sibutu (DMNH), Sibuyan (FMNH, Simunul (DMNH), and Siquijor (FMNH). Also reported from Luzon (Laguna province) (Catibog-Sinha, 1987) and from Caluya, Sibay, Semirara, Boracay, and Carabao islands (Alcala & Alviola, 1970).

HABITAT—Occurs in virtually every habitat in the country from sea level to at least 2250 m. Abundant in agricultural and other heavily disturbed areas, common in secondary forest, and uncommon in primary forests (Heaney et al., 1989, in press; Heideman & Heaney, 1989; Lepiten, 1995; Rickart et al., 1993).

STATUS—Abundant and widespread, with populations stable or increasing (Utzurrum, 1992).

Megaerops wetmorei Taylor, 1934. Monogr. Bur. Sci. Manila, 30:191.

COMMON NAME—Mindanao fruit bat.

DISTRIBUTION—Borneo to peninsular Malaysia (Francis, 1989); in the Philippines recorded only on Mindanao Island (Agusan del Norte [UPLB], Bukidnon [FMNH], Davao del Sur [UPLB], Davao Oriental [UPLB], Lanao del Norte [UPLB], Lanao del Sur [DMNH], Misamis Oriental [UPLB], South Cotabato [UPLB], and Zamboanga del Sur (DMNH) provinces).

HABITAT—Known in the Philippines only from primary and lightly disturbed lowland forest from 800 m to 1200 m; probably absent from montane and mossy forest above 1500 m (Heaney et al., unpubl. data). Poorly known.

STATUS—Within the Philippines, geographically restricted and confined to rapidly disappearing lowland forest on Mindanao.

Nyctimene rabori Heaney and Peterson, 1984. Occas. Pap. Mus. Zool. Univ. Michigan, 708:3.

COMMON NAME—Philippine tube-nosed fruit bat.

DISTRIBUTION—Endemic to the Philippines; recorded only from Cebu (Vinciguerra & Muller, 1993), Negros (FMNH), and Sibuyan (FMNH).

HABITAT—Restricted to lowland forest, usually in primary forest but known to occur in secondary forest on Cebu (Vinciguerra & Muller, 1993) and Sibuyan (Goodman & Ingle, 1993). Known from 200 m to 1300 m on Negros but probably now absent below 600 m because of the absence of forest. Rare or uncommon at all known sites (Heaney & Peterson, 1984; Heaney et al., 1989; Heideman & Heaney, 1989; Mickleburgh et al., 1992; Utzurrum, 1992). On Sibuyan, known only from lightly disturbed mature forest near sea level (Goodman & Ingle, 1993).

STATUS—Populations have declined severely since 1950 as a result of habitat destruction, and they face extinction on Negros Island, and perhaps elsewhere, within 10 years if current trends continue (Mickleburgh et al., 1992; Utzurrum, 1992). IUCN: Critically endangered.

Otopteropus cartilagonodus Kock, 1969. Senckenberg. Biol., 50:333.

COMMON NAME—Luzon pygmy fruit bat.

DISTRIBUTION—Endemic to the Philippines, where it is widespread on Luzon Island. Recorded from Abra (SMF), Aurora (UPD), Cagayan (PNM), Camarines Sur (FMNH), Isabela (FMNH), Laguna (PNM), Mountain (BMNH), Nueva Viscaya (PNM), Quezon (PNM), and Zambales (PNM) provinces.

HABITAT—Known only from primary and well-developed secondary forest in lowland, montane, and mossy forest from 200 m to 1900 m. Abundance is low to moderate, usually most common at middle elevations (Kock, 1969c, Mickleburgh

et al., 1992; Ruedas et al., 1994; Utzurrum, 1992; Heaney et al., in press).

STATUS—Apparently stable because of its primary use of middle and upper elevation forest, but poorly known. IUCN: Endangered (but we consider the listing to be premature).

COMMENT—Reproductive biology documented by Heideman et al. (1993).

Ptenochirus jagori (Peters, 1861). Monatsb. K. Preuss. Akad. Wiss. Berlin, p. 707.

COMMON NAME—Musky fruit bat.

DISTRIBUTION—Endemic to the Philippines, except the Batanes/Babuyan and Palawan faunal regions. Specimens from Biliran (USNM), Bohol (USNM), Bongao (DMNH), Camiguin (FMNH), Catanduanes (FMNH), Cebu (FMNH), Dinagat (USNM), Leyte (USNM), Luzon (Abra [FMNH], Albay [FMNH], Aurora [UPD], Batangas [UPLB], Benguet [FMNH], Cagayan [USNM], Camarines Sur [FMNH], Isabela [FMNH], Laguna [FMNH], Mountain Province [FMNH], Nueva Viscaya [UPLB], Pampanga [USNM], Quezon [UMMZ], Rizal [UPLB], Sorsogon [FMNH], Tarlac [USNM], and Zambales [UPD] provinces), Marinduque (PNM), Maripipi (USNM), Masbate (SU), Mindanao (Agusan del Norte [DMNH], Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Davao Oriental [DMNH], Lanao del Norte [DMNH], Lanao del Sur [DMNH], Misamis Oriental [DMNH], Surigao del Sur [DMNH], and Zamboanga del Sur [FMNH] provinces), Mindoro (FMNH), Negros (FMNH), Panay (SU), Polillo (FMNH), Samar (FMNH), Sanga-sanga (DMNH), Siargao (DMNH), Sibuyan (FMNH), and Siquijor (FMNH). Also reported from Caluya, Sibay, Semirara, Boracay, and Carabao islands (Alcala & Alviola, 1970).

HABITAT—Abundant in primary forest, common in secondary forest, and occasionally present in agricultural areas near forest. Ranges from sea level to at least 1800 m, and is most common in lowland forest, uncommon in montane forest, and absent in mossy forest (Heaney et al., 1989, in press; Heideman & Heaney, 1989; Ingle, 1992, 1993; Lepiten, 1995; Mudar & Allen, 1986; Rickart et al., 1993).

STATUS—Populations large and generally stable, widespread, but subject to continuing habitat destruction (Utzurrum, 1992).

Ptenochirus minor Yoshiyuki, 1979. Bull. Natl. Sci. Mus. Tokyo, ser. A (Zool.), 5:75.

COMMON NAME—Lesser musky fruit bat.

DISTRIBUTION—Endemic to the Mindanao Faunal Region. Specimens are from Biliran (USNM), Dinagat (USNM), Leyte (FMNH), and Mindanao (Agusan del Norte [DMNH], Bukidnon [FMNH], Cotabato [AMNH], and Davao del Sur [Yoshiyuki, 1979] provinces). A record from Palawan (Yoshiyuki, 1979) is probably erroneous.

HABITAT—Recorded from sea level to 1600 m. Common in primary lowland and montane forest and sometimes present in mossy forest. Uncommon in secondary forest (Heaney et al., 1989; Rickart et al., 1993).

STATUS—Populations have declined as a result of destruction of lowland forest habitat, but they are still common and widespread; stable.

Pteropus dasymallus Temminck, 1825. Monogr. Mamm. 1:180.

COMMON NAME—Ryukyu flying fox, wooly flying fox.

DISTRIBUTION—Ryukyu island group to Taiwan and the Batanes/Babuyan region; in the Philippines, recored on Batan (USNM), Dalupiri (FMNH), and Fuga (FMNH).

HABITAT—Reported to be common in forest on the Batanes and Babuyan islands but is poorly known (Ingle & Heaney, 1992; Utzurrum, 1992; Ross, pers. comm.).

STATUS—Uncertain. Previously known populations are considered endangered to varying degrees (Mickleburgh et al., 1992). The Philippine population probably is the largest for the species. IUCN: Endangered. CITES: Appendix II.

Pteropus hypomelanus Temminck, 1853. Esquisses Zool. sur la Côte de Guine, p. 61.

COMMON NAME—Common island flying fox.

DISTRIBUTION—Thailand to Australia. Found throughout the Philippines except Palawan and Batanes/Babuyan faunal regions. Records are from Cagayan Sulu (USNM), Camiguin (DMNH), Cebu (SU), Cuyo (FMNH), Dinagat (USNM), Guimaras (FMNH), Leyte (UMMZ), Luzon (Camarines Sur [AMNH], Ilocos Norte [USNM], and Nueva Ecija

[UPD] provinces), Mactan (FMNH), Marinduque (MCZ), Maripipi (USNM), Negros (FMNH), Panay (FMNH), Polillo (FMNH), Samar (USNM), Siargao (DMNH), Sibuyan (FMNH), and Siquijor (FMNH). Also reported from Mindanao (Gunther, 1879) and Romblon (Timm & Birney, 1980).

HABITAT—Common in agricultural areas from sea level to ca. 900 m; absent in primary forest (Heideman & Heaney, 1992; Rickart et al., 1993; Utzurrum, 1992). They often roost on small islands.

STATUS—Heavily hunted in some areas, but stable. CITES: Appendix II.

Pteropus leucopterus Temminck, 1853. Esquisses Zool. sur la Côte de Guine, p. 60.

COMMON NAME—Mottle-winged flying fox, white-winged flying fox.

DISTRIBUTION—Endemic to the Luzon Faunal Region and Dinagat. Specimens have been recorded from Catanduanes (FMNH), Dinagat (DMNH), and Luzon (Abra [SMF], Cagayan [USNM], Isabela [AMNH], Laguna [PNM], Nueva Viscaya [PNM], and Quezon [USNM] provinces).

HABITAT—Poorly known. Moderately common in primary montane forest on Catanduanes, present in lowland forest (Heaney et al., 1991; Mickleburgh et al., 1992; Utzurrum, 1992; Heaney et al., unpubl. data).

STATUS—Poorly known but probably has declined significantly as a result of habitat destruction (Utzurrum, 1992). IUCN: Endangered. CITES: Appendix II.

Pteropus pumilus Miller, 1910. Proc. U.S. Natl. Mus., 38:394.

COMMON NAME—Little golden-mantled flying fox.

DISTRIBUTION—Endemic to the Philippines, excluding the Batanes/Babuyan and Palawan faunal regions. It is also on Miangas Island, Indonesia, adjacent to Mindanao. Records are from Balut (USNM), Camiguin (DMNH), Leyte (DMNH), Maripipi (USNM), Masbate (SU), Mindanao (Zamboanga del Sur [USNM]), Mindoro (MCZ), Negros (FMNH), Palmas (USNM), Panay (SU), Sibuyan (FMNH), Siquijor (SU), and Tablas (AMNH).

HABITAT—Associated with primary and well-developed secondary lowland forest from sea level to about 1000 m, rarely to 1250 m, uncommon outside of forest. This species is most common on small islands and uncommon to rare on larger islands (Heaney, 1984; Heaney et al., 1989; Heideman & Heaney, 1989; Lepiten, 1995; Rickart et al., 1993; Utzurrum, 1992).

STATUS—Declining as a result of habitat destruction, but still fairly widespread and stable. IUCN: Vulnerable. CITES: Appendix II.

COMMENT—Includes *P. balutus* and *P. tablasi* (Klingener & Creighton, 1984).

Pteropus speciosus K. Andersen, 1908. Ann. Mag. Nat. Hist., ser. 8, 2:364.

COMMON NAME—Philippine gray flying fox.

DISTRIBUTION—Two islands in the Java Sea, Indonesia, and the Mindanao and Sulu faunal regions. Reported from Basilan (USNM), Malanipa (USNM), Mindanao (Zamboanga del Sur Province [FMNH]), Sanga-sanga (DMNH), Sibutu (DMNH), and Tawi-tawi (AMNH).

HABITAT—Virtually unknown. Recent reports from Tawi-tawi indicate that they are represented by at least several large colonies.

STATUS—Unknown and geographically restricted. IUCN: Vulnerable. CITES: Appendix II.

COMMENT—Includes *P. mearnsi* (Heaney et al., 1987) and may be conspecific with *P. griseus* (Mickleburgh et al., 1992). Some previous reports from Cebu, Mactan, and Negros were based on subadult *P. hypomelanus*.

Pteropus vampyrus (Linnaeus, 1758). Syst. Nat., 10th ed., 1:31.

COMMON NAME—Large flying fox.

DISTRIBUTION—Indochina to the Lesser Sundas; throughout the Philippines except the Batanes/Babuyan region. Records from Bohol (FMNH), Bongao (DMNH), Cabo (USNM), Catanduanes (BMNH), Culion (USNM), Leyte (FMNH), Guimaras (UMMZ), Luzon (Abra [FMNH], Cagayan [UPLB], Ilocos Norte [USNM], Isabela [UMMZ], La Union [USNM], and Tarlac (USNM) provinces), Marinduque (PNM), Mindanao (Agusan del Norte [UPLB], Bukidnon [AMNH], Cotabato [AMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Davao Oriental [UPLB], Lanao del Norte [USNM], Lanao del Sur [USNM], Maguindanao [FMNH], Misamis Occidental [USNM], Misamis Oriental [FMNH], North Cotabato [DMNH], South Cotabato [UPLB], Zamboanga

del Notre [AMNH], and Zamboanga del Sur [USNM] provinces), Mindoro (AMNH), Negros (FMNH), Palawan (FMNH), Panay (FMNH, USNM), and Tantangan (USNM). Also reported from Dinagat (Gunther, 1879) and Romblon (Timm & Birney, 1980).

HABITAT—Widespread and locally common in primary lowland forest up to 1250 m; also forage in adjacent agricultural areas (Rabor, 1955, 1986; Rickart et al., 1993; Sanborn, 1953).

STATUS—Formerly occurred in many large colonies, but these are now greatly reduced in size and number (Heideman & Heaney, 1989; Mickleburgh et al., 1992; Mudar & Allen, 1986; Rickart et al., 1993). Heavily hunted and declining substantially (Utzurrum, 1992). CITES: Appendix II.

Pteropus sp. A.

COMMON NAME—Mindoro pallid flying fox.

DISTRIBUTION—Known only from Mindoro Island (Heaney, Dans, & Crombie, unpubl. data).

HABITAT—Recorded only in disturbed lowland forest (Heaney, Dans, & Crombie, unpubl. data).

STATUS—Known only from patches of forest in the lowlands of Mindoro, which have undergone extensive deforestation (see maps in Custodio et al., 1996; Oliver et al., 1993a). Populations certainly very small and fragmented. This species is probably highly endangered.

Rousettus amplexicaudatus (É. Geoffroy, 1810). Ann. Mus. Hist. Nat. Paris 15:96.

COMMON NAME—Common rousette.

DISTRIBUTION—Thailand to the Solomon Islands; throughout the Philippines. Records from Balabac (USNM), Barit (FMNH), Biliran (USNM), Bohol (USNM), Busuanga (USNM), Catanduanes (FMNH), Cebu (AMNH), Dalupiri (FMNH), Dinagat (USNM), Fuga (FMNH), Jolo (AMNH), Leyte (FMNH), Lubang (MCZ), Luzon (Abra [MCZ], Cagayan [UMMZ], Ilocos Norte [USNM], Isabela [FMNH], Laguna [UPLB], Quezon [UMMZ], Rizal [FMNH], Sorsogon [FMNH], and Zambales [USNM] provinces), Marinduque (UPD), Maripipi (USNM), Mindanao (Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [UPLB], Lanao del Norte [UPD], Lanao del Sur [UPLB], Misamis Oriental [UPLB], South Cotabato [UPLB], Surigao del Sur [UPLB], and Zamboanga del Sur [MCZ]), Mindoro (FMNH), Negros (FMNH), Palawan (USNM), Panay (SU), Polillo (FMNH), Samal (FMNH), Siargao (DMNH), Sibuyan (FMNH), Siquijor (FMNH), Tablas (SU), and Tincansan (UMMZ). Also reported from Caluya, Sibay, Semirara, Boracay, and Carabao islands (Alcala & Alviola, 1970).

HABITAT—Abundant and widespread in agricultural areas up to 500 m, uncommon in agricultural areas from 500 m to 1100 m, and rare elsewhere (Heaney et al., 1989, 1991, in press; Heideman & Heaney, 1989; Lepiten, 1995; Rickart et al., 1993). All known roosting sites are in caves.

STATUS—Locally abundant, generally stable, but subjected to intense hunting at some cave roosts (Utzurrum, 1992).

Emballonuridae—Sheath-tailed Bats

Three species in this family occur in the Philippines; none are endemic. A representative species is shown in Figure 5D.

Emballonura alecto (Eydoux & Gervais, 1836). Mag. Zool. Paris, 6:7.

COMMON NAME—Philippine sheath-tailed bat.

DISTRIBUTION—Borneo, Philippines, and Sulawesi; probably throughout the Philippines except the Batanes/Babuyan region. Specimens are from Balabac (USNM), Biliran (USNM), Bohol (USNM), Camiguin (ROM), Catanduanes (USNM), Dinagat (DMNH), Guimaras (FMNH), Leyte (USNM), Luzon (Camarines Sur [FMNH], Laguna [CUVC], and Quezon [UPLB] provinces), Maripipi (USNM), Mindanao (Davao del Norte [FMNH], Davao del Sur [FMNH], Zamboanga del Norte [FMNH], and Zamboanga del Sur [AMNH] provinces), Negros (FMNH), and Panay (USNM).

HABITAT—Recorded only in lowland areas (450 m and below) in disturbed forest and agricultural areas with scattered remnant forest. Most records are from individuals captured in caves, under large boulders, or in man-made tunnels (Heaney et al., 1991, in press; Ingle, 1992; Rabor, 1986; Rickart et al., 1993; Taylor, 1934).

STATUS—Common in areas with caves in or near forest; apparently rare elsewhere.

Saccolaimus saccolaimus (Temminck, 1838). Tijdschr. Nat. Gesch. Physiol., 5: 14.

COMMON NAME—Pouched bat.

DISTRIBUTION—Widespread, from India to Ti-

mor, New Guinea, and northern Australia. In the Philippines, recorded from Catanduanes (USNM), Mindanao (Misamis Oriental [DMNH] and Zamboanga del Sur [USNM] provinces), and Negros (USNM).

HABITAT—Recorded from sea level to 800 m. Poorly known; may be moderately common in agricultural areas.

STATUS—Unknown.

COMMENT—Philippine population formerly considered to be a distinct species, *S. pluto* (Corbet & Hill, 1992; Heaney et al., 1991; Koopman, 1993).

Taphozous melanopogon Temminck, 1841. Monogr. Mamm., 2:287.

COMMON NAME—Black-bearded tomb bat.

DISTRIBUTION—Widespread from Sri Lanka to Southeast Asia and the Lesser Sunda Islands. Recorded from Biliran (UMMZ), Cebu (AMNH), Gigante (UMMZ), Leyte (UMMZ), Luzon (Ilocos Norte [USNM], Nueva Viscaya [UPLB], Pangasinan [FMNH], and Rizal [USNM] provinces), Maripipi (USNM), Mindanao (Davao del Sur [FMNH]), Negros (FMNH), Palawan (UMMZ), Sibuyan (FMNH), and Tincasan (UMMZ). Also reported from Lubang, Luzon (Abra Province) and Mindoro (Lawrence, 1939).

HABITAT—Common in urban areas, in areas with limestone caves, and in sea caves, at elevations at or below 150 m (Lawrence, 1939; Rickart et al., 1993; Sanborn, 1952; Taylor, 1934). Often roost in shallow portions of caves; and in churches and other buildings with large attics.

STATUS—Widespread in Asia; abundant in the Philippines.

COMMENT—Philippine populations were formerly separated as *T. philippinensis*. We consider the latter to be a subspecies of this widespread species (Corbet & Hill, 1992; Koopman, 1993; Rickart et al., 1993).

Megadermatidae—False Vampire and Ghost Bats

A single species from this family occurs in the Philippines; its appearance is shown in Figure 5B.

Megaderma spasma (Linnaeus, 1758). Syst. Nat., 10th ed., 1:32.

COMMON NAME—Common Asian ghost bat. Lesser false vampire.

DISTRIBUTION—India to the Molucca Islands; throughout the Philippines except the Batanes/Babuyan region. Recorded on Biliran (USNM), Bohol (USNM), Busuanga (USNM), Catanduanes (USNM), Cebu (AMNH), Dinagat (DMNH), Leyte (USNM), Luzon (Aurora [UPD], Camarines Sur [USNM], Isabela [FMNH], and Rizal [USNM] provinces), Mindanao (Davao del Norte [FMNH], Lanao del Norte [USNM], Misamis Occidental [USNM], South Cotabato [FMNH], and Zamboanga del Sur [UPLB] provinces), Mindoro (FMNH), Negros (FMNH), Palawan (UMMZ), Panay (SU), Polillo (FMNH), and Siquijor (SU). Also reported from Davao Oriental Province (Mindanao) and Negros by Sanborn (1952), from Abra Province (Luzon) and Cebu by Lawrence (1939), and from Laguna Province (Luzon) by Taylor (1934) and Ingel (1992).

HABITAT—Lowland primary and disturbed forest from sea level to 950 m (Heaney et al., 1991). Known to roost in caves, tree-hollows, and hollow logs (Heaney et al., in press; Ingle, 1992; Lawrence, 1939; Lepiten, 1995; Rabor, 1986; Rickart et al., 1993; Taylor, 1934).

STATUS—Widepread, locally common to uncommon in primary forest and secondary forest.

Rhinolophidae—Horseshoe and Roundleaf Bats

With 18 species currently recognized in the Philippines, this is one of the most diverse families of mammals in the Philippines; the appearance of a representative species is shown in Figure 5C. However, the family is poorly known, principally because rhinolophids are difficult to capture with mist nets. The dearth of museum specimens (both from the Philippines and elsewhere) is a major reason for continuing uncertainty regarding the taxonomy of several members of this family (Hill, 1983). We expect future surveys, especially those employing harp traps, to add to both the number and known distribution of the rhinolophids from the Philippines. Many species require caves as roosting sites and have been impacted negatively by the widespread disturbance of caves. Other species roost in large hollow trees, especially in lowland dipterocarp forest, and have been severely affected by logging that

destroys both the roosting trees and the foraging habitat.

Coelops hirsutus (Miller, 1911). Proc. U.S. Natl. Mus., 38:395.

COMMON NAME—Philippine tailless roundleaf bat.

DISTRIBUTION—Specimens only from Mindanao (Bukidnon [FMNH]) and Mindoro (USNM).

HABITAT—May be dependent on caves.

STATUS—Unknown.

COMMENT—May be a subspecies of *C. robinsoni,* known from the Malay Peninsula and Borneo (Corbet & Hill, 1992).

Hipposideros ater Templeton, 1848. J. Asiat. Soc. Bengal, 17:252.

COMMON NAME—Dusky roundleaf bat.

DISTRIBUTION—India to Australia; throughout the Philippines. Recorded from Bohol (USNM), Catanduanes (USNM), Cebu (AMNH), Leyte (USNM), Luzon (Abra [SMF], Cagayan [FMNH], Camarines Sur [USNM], Laguna [FMNH], Pampanga [USNM], Rizal [USNM], and Tarlac [USNM] provinces), Maripipi (USNM), Mindanao (Davao del Sur [FMNH]), Mindoro (FMNH), Negros (FMNH), and Palawan (FMNH). Also reproted from Balabac by Hill (1963), Benguet Province (Luzon) by Taylor (1934), and Marinduque and Mindoro by Lawrence (1939).

HABITAT—Poorly known; recorded from sea level to 1200 m in lowland and montane forest. Known to roost in caves in forest and in agricultural areas (Heaney et al., 1991; Rickart et al., 1993).

STATUS—Geographically widespread. In the Philippines, probably has declined as a result of destruction of lowland forest and distrubance of caves.

COMMENT—Hill (1963) included *H. wrighti* Taylor 1934 as a synonym of this species.

Hipposideros bicolor (Temminck, 1834). Tijdschr. Nat. Gesch. Physiol., 1:19.

COMMON NAME—Bicolored roundleaf bat.

DISTRIBUTION—India to Timor; Philippine specimens from Luzon (Camarines Sur Province [USNM]), Mindoro (MCZ), and Palawan (UMMZ).

HABITAT—Unknown in the Philippines. Roosts in caves in peninsular Malaysia (Payne et al., 1985).

STATUS—Unknown.

Hipposideros cervinus (Gould, 1863). Mamm. Austr., 3: pl. 34.

COMMON NAME—Fawn-colored roundleaf bat.

DISTRIBUTION—Peninsular Malaysia to Australia and Vanuatu; Philippine specimens from Mindanao (Davao del Sur [FMNH] and Maguindanao [FMNH]) only.

HABITAT—Virtually unknown in the Philippines; recorded in caves on Mindanao (Sanborn, 1952). On Borneo, usually roosts in caves and forages in forest (Payne et al., 1985).

STATUS—Unknown.

COMMENT—The taxonomic status and distribution of this species were discussed by Jenkins and Hill (1981).

Hipposideros coronatus (Peters, 1871). Monatsb. K. Preuss. Akad. Wiss. Berlin, p. 327.

COMMON NAME—Large Mindanao roundleaf bat.

DISTRIBUTION—Known only from Mainit, Surigao del Norte Province, Mindanao (Peters, 1871).

HABITAT—Unknown.

STATUS—Unknown; geographically restricted.

Hipposideros diadema (É. Geoffroy, 1813). Ann. Mus. Hist. Nat. Paris, 20: 263.

COMMON NAME—Diadem roundleaf bat.

DISTRIBUTION—Burma to the Solomon Islands; throughout the Philippines except the Batanes/Babuyan region. Specimens from Bohol (USNM), Busuanga (USNM), Calauit (UMMZ), Catanduanes (USNM), Dinagat (DMNH), Guimaras (FMNH), Leyte (USNM), Luzon (Bulacan [USNM], Cagayan [PNM], Camarines Sur [USNM], Ilocos Norte [USNM], Isabela [FMNH, UMMZ], Laguna [AMNH], Nueva Vizcaya [UMMZ], Pampanga [USNM], and Quezon [UMMZ] provinces), Mindanao (Agusan del Norte [SU], Bukidnon [FMNH], Davao Oriental [UPLB], Lanao del Norte [UPLB], Maguindanao [FMNH],

and Zamboanga del Norte [SU]), Negros (FMNH), Palawan (USNM), Panay (SU), Polillo (FMNH), Samar (USNM), and Siquijor (FMNH). Also reported from South Cotabato Province (Mindanao) by Sanborn (1952), from Cebu and Mindoro by Lawrence (1939), from Benguet and Rizal provinces (Luzon), and Zamboanga del Sur Province (Mindanao) by Taylor (1934).

HABITAT—In primary forest and disturbed lowland areas from sea level to 900 m. Roost in hollow trees and in caves and human-made tunnels (Heaney et al., in press; Lepiten, 1995; Rickart et al., 1993; Sanborn, 1952).

STATUS—Widespread and common.

Hipposideros lekaguli Thonglongya and Hill, 1974. Mammalia, 38:286.

COMMON NAME—Large Asian roundleaf bat.

DISTRIBUTION—Thailand, peninsular Malaysia, and the Philippines. In the Philippines, recorded only on Luzon (Isabela [FMNH] Province) and Mindoro (FMNH) (Balete et al., 1995).

HABITAT—The two known specimens from the Philippines were collected close to sea level in ultrabasic forest and in an agricultural area near a river (Balete et al., 1995).

STATUS—Unknown.

COMMENT—As currently defined, this species is variable geographically. A comprehensive revision is needed.

Hipposideros obscurus (Peters, 1861). Monatsb. K. Preuss. Akad. Wiss. Berlin, p. 707.

COMMON NAME—Philippine forest roundleaf bat.

DISTRIBUTION—Philippines only. Specimens are from Bohol (USNM), Catanduanes (FMNH), Dinagat (DMNH), Luzon (Benguet [AMNH], Camarines Sur [USNM], Laguna [AMNH], Pampanga [USNM], and Tarlac [USNM] provinces), Maripipi (USNM), Mindanao (Bukidnon [FMNH] and South Cotabato [AMNH] provinces), Negros (USNM), and Siquijor (SU).

HABITAT—Locally common to uncommon in primary and disturbed forest up to 850 m (Heaney et al., in press; Lepiten, 1995; Rickart et al., 1993). Several records of specimens taken in caves, one in a mine shaft, one in a dark cavity in a tree buttress (Heaney et al., 1991; Taylor, 1934), and one in a hollow tree (Sanborn, 1952).

STATUS—Widespread, but dependent on forest and perhaps on caves.

Hipposideros pygmaeus (Waterhouse, 1843). Proc. Zool. Soc. Lond. p. 67.

COMMON NAME—Philippine pygmy roundleaf bat.

DISTRIBUTION—Philippines only. Specimens taken from Bohol (USNM), Luzon (Camarines Sur [FMNH], and Rizal [USNM] provinces), Marinduque (PNM), Negros (FMNH), and Panay (SU).

HABITAT—The few specimens were taken in caves from sea level to 200 m, in or near forest (Sanborn, 1952; Taylor, 1934).

STATUS—Widespread but seemingly rare. This species is probably strongly impacted by the destruction of cave habitats.

Rhinolophus acuminatus Peters, 1871. Monatsb. K. Preuss. Akad. Wiss. Berlin, p. 308.

COMMON NAME—Acuminate horseshoe bat.

DISTRIBUTION—Thailand to Lombok; in the Philippines, known only from the Palawan Faunal Region. Recorded from Balabac (USNM), Busuanga (USNM), and Palawan (FMNH).

HABITAT—Unknown in the Philippines. Occurs in lowland dipterocarp forest on Borneo (Payne et al., 1985).

STATUS—Uncertain, apparently locally common.

Rhinolophus anderseni Cabrera, 1909. Bol. Real. Soc. Esp. Hist. Nat., p. 305.

COMMON NAME—Andersen's horseshoe bat.

DISTRIBUTION—Philippines only, where it is recorded from Luzon (Cabrera, 1909) and Palawan (Allen, 1922; UMMZ).

HABITAT—Unknown.

STATUS—Unknown, rare in collections.

COMMENT—Corbet and Hill (1992) consider this species close to *R. nereis* and *R. borneensis*. The form *R. anderseni aequalis* Allen 1922, which is the basis for the Palawan record, is of uncertain relationship. We consider this group to be badly in need of review.

Rhinolophus arcuatus Peters, 1871. Monatsb. K. Preuss. Akad. Wiss. Berlin, p. 305.

COMMON NAME—Arcuate horseshoe bat.

DISTRIBUTION—Sumatra to New Guinea; throughout the Philippines, possibly excluding the Palawan Faunal Region. Specimens from Biliran (USNM), Camiguin (DMNH), Catanduanes (USNM), Dalupiri (FMNH), Fuga (FMNH), Guimaras (USNM), Leyte (USNM), Luzon (Abra [SMF], Cagayan [PNM], Camarines Sur [FMNH], Isabela [FMNH], Laguna [FMNH], Pampanga [USNM], and Rizal [USNM] provinces), Maripipi (USNM), Masbate (SU), Mindanao (Bukidnon [FMNH], Davao del Sur [FMNH], Maguindanao [FMNH], Zamboanga del Norte [FMNH], and Zamboanga del Sur [BMNH] provinces), Mindoro (FMNH), Negros (FMNH), Panay (SU), Polillo (FMNH), Sibutu (DMNH), Sibuyan (FMNH), Siquijor (SU), and Tawi-tawi (DMNH).

HABITAT—From lowlands to at least 1050 m, in agricultural lands to primary forest (Heaney et al., 1991, in press; Lepiten, 1995; Rickart et al., 1993). Roosting sites sometimes in caves (Sanborn, 1952.)

STATUS—Widespread, locally common.

COMMENT—Heaney et al. (1991), Ingle and Heaney (1992), and Rickart et al. (1993) have commented that, on most islands, there appears to be a smaller lowland morph associated with caves in agricultural areas and a larger highland morph associated with primary forest. We have also noted subtle but consistent differences between populations on each Pleistocene island. Further systematic studies are needed.

Rhinolophus inops K. Andersen, 1905. Ann. Mag. Nat. Hist., ser. 7, 16:284, 651.

COMMON NAME—Philippine forest horseshoe bat.

DISTRIBUTION—Philippines only, where it is recorded from Biliran (USNM), Camiguin (MSU–IIT), Catanduanes (USNM), Leyte (USNM), Luzon (Camarines Sur [USNM], and Pampanga [USNM] provinces), Mindanao (Bukidnon [FMNH] and Davao del Sur [USNM] provinces), Negros (FMNH), and Polillo (FMNH).

HABITAT—Common to abundant in primary lowland and montane forest from sea level to 2250 m, rarely in secondary forest and mossy forest (Heaney et al., 1991, in press; Rickart et al., 1993).

STATUS—Locally abundant, but dependent on primary forest.

COMMENT—As noted by Ingle and Heaney (1992), there are several problems with the taxonomy of *R. inops*. First, the holotype of *R. inops* has a distinctively shaped nose-leaf not found in any of the specimens referred to this species. Second, there is considerable geographic variation, and species as currently defined may represent a species group. Careful study is needed.

Rhinolophus macrotis Blyth, 1844. J. Asiat. Soc. Bengal, 13:485.

COMMON NAME—Big-eared horseshoe bat.

DISTRIBUTION—India to Sumatra and the Philippines. Specimens from Guimaras (USNM), Luzon (Abra [SMF] and Pampanga [USNM]), Mindanao (Bukidnon [SMF]), and Negros (FMNH).

HABITAT—Recorded in lowland forest from 200 m to 1050 m. Poorly known in the Philippines. There are some records from caves in forest.

STATUS—Widespread but seemingly uncommon.

COMMENT—The Philippine form of *R. macrotis* was initially described as a separate species, *R. hirsutus* (Andersen, 1905), but was later subsumed under *R. macrotis* by Tate (1943). Philippine populations are morphologically distinct from all others and may deserve recognition as a distinct species (Ingle & Heaney, 1992). More specimens are needed to assess this issue.

Rhinolophus philippinensis Waterhouse, 1843. Proc. Zool. Soc. Lond., p. 68.

COMMON NAME—Enormous-eared horsehoe bat.

DISTRIBUTION—Borneo and the Philippines to Australia (Tate, 1943); Philippine records from Luzon (Abra Province [SMF]), Mindanao (Zamboanga del Norte [FMNH], and Zamboanga del Sur [UPLB] provinces), Mindoro (MCZ), Negros (FMNH), and Siquijor (FMNH).

HABITAT—Recorded in primary and secondary forest from 200 m to 1500 m (Lepiten, 1995; Ruedas et al., 1994; Heaney, unpubl. data).

STATUS—Uncertain, but uncommon. Captured only in forest.

Rhinolophus rufus Eydoux and Gervais, 1836. *In* Laplace, Voy. autour du monde par les mers de l'Inde . . . . la Favorite, 5(Zoologie), part 2:9.

COMMON NAME—Large rufous horseshoe bat.

DISTRIBUTION—Philippines only, where it is recorded from Bohol (USNM), Catanduanes (USNM), Leyte (DMNH), Luzon (Laguna [AMNH], Pampanga [USNM], and Rizal [USNM] provinces), Marinduque (FMNH), Mindanao (Davao del Sur [FMNH] and Maguindanao [FMNH] provinces), Mindoro (MCZ), Polillo (FMNH).

HABITAT—Recorded in primary and good secondary forest, either in or near caves (Heaney et al., 1991; Lawrence, 1939; Sanborn, 1952).

STATUS—Uncertain; generally uncommon and probably dependent on lowland caves, most of which have been heavily disturbed.

Rhinolophus subrufus K. Andersen, 1905. Ann. Mag. Nat. Hist., ser. 7, 16: 283.

COMMON NAME—Small rufous horseshoe bat.

DISTRIBUTION—Philippines only; specimens from Camiguin (DMNH), Catanduanes (USNM), Luzon (Abra [FMNH], Camarines Sur [USNM], Isabela [FMNH], Laguna [FMNH], Pampanga [USNM], Rizal [BMNH], and Sorsogon [FMNH] provinces); Mindanao (Davao del Sur [USNM] and South Cotabato [AMNH] provinces), and Mindoro (FMNH).

HABITAT—Poorly known. Recorded from near sea level to over 1000 m, with some records from caves.

STATUS—Unknown. IUCN: Vulnerable. We believe this listing to be premature, given the current lack of knowledge.

Rhinolophus virgo K. Andersen, 1905. Proc. Zool. Soc. Lond. p. 88.

COMMON NAME—Yellow-faced horseshoe bat.

DISTRIBUTION—Philippines only, found throughout the Philippines. Records from Batan (USNM), Busuanga (USNM), Catanduanes (USNM), Cebu (AMNH), Jolo (AMNH), Leyte (USNM), Luzon (Abra [SMF], Camarines Sur [USNM], Isabela [FMNH], Laguna [AMNH], Pampanga [USNM], and Sorsogon [FMNH] provinces), Maripipi (USNM), Mindanao (Bukidnon Province [SMF]), Negros (FMNH), Palawan (FMNH), and Sibuyan (FMNH). Also reported from Mindanao (South Cotabato Province [Taylor, 1934]) and Lubang (Lawrence, 1939).

HABITAT—Primary lowland forest from 250 m to 1100 m, with several records from caves (Heaney et al., 1991; Rickart et al., 1993) and one from a darkened cavity in a tree buttress (Taylor, 1934).

STATUS—Widespread and moderately common.

COMMENT—Closely related to *R. celebensis* (Corbet & Hill, 1992).

Vespertilionidae—Vesper and Evening Bats

Twenty-two species of vespertilionids, including the recently recorded *Harpiocephalus harpia* (Rickart et al., 1993), are now known from the Philippines. The appearance of a representative species is shown in Figure 5F. Only one species, *Myotis rufopictus,* is considered to be endemic.

Glischropus tylopus (Dobson, 1875). Proc. Zool. Soc. Lond., p. 473.

COMMON NAME—Thick-thumbed pipistrelle.

DISTRIBUTION—Burma to Molucca Islands; Philippine records from Palawan only (USNM).

HABITAT—Unknown in the Philippines. Roosts in rock crevices, in hollow bamboo, and in new banana leaves in peninsular Malaysia (Payne et al., 1985).

STATUS—Unknown.

Harpiocephalus harpia (Temminck, 1840). Monogr. Mamm., 2:219.

COMMON NAME—Hairy-winged bat.

DISTRIBUTION—India to Indochina and Taiwan, Java, Molucca, and the Sunda Islands. In the Philippines recorded only from Luzon (Camarines Sur [USNM] Province), Leyte (USNM), Negros (FMNH), and Panay (PAWB and Japan Wildlife Research Center).

HABITAT—In the Philippines, known from primary and disturbed lowland forest from 475 m to 750 m (Heaney et al., in press; Ingle & Heaney, 1992; Rickart et al., 1993; Utzurrum, unpubl. data).

STATUS—Widespread in southern Asia; probably dependent on lowland forest.

Kerivoula hardwickii (Horsfield, 1824). Zool. Res. Java, part 8:28.

COMMON NAME—Common woolly bat.

DISTRIBUTION—India and southern China to Lesser Sunda Islands. Philippine records are from Biliran (USNM), Leyte (USNM), Luzon (Camarines Sur [USNM] Province), Mindanao (Bukidnon [FMNH] Province), and Palawan (UMMZ). Also reported from Samar (Taylor, 1934).

HABITAT—In the Philippines, recorded from 500 m to 1600 m in lowland, montane, and ridgetop mossy forest (Heaney et al., in press; Rickart et al., 1993).

STATUS—Widespread in southern Asia. Probably moderately common in primary forest.

Kerivoula pellucida (Waterhouse, 1845). Proc. Zool. Soc. Lond., p. 6.

COMMON NAME—Clear-winged woolly bat.

DISTRIBUTION—Borneo, Java, Malay Peninsula, Sumatra, and the Philippines; records are from Mindanao (Davao del Norte [FMNH]) and Palawan (UMMZ). Also reported from Jolo (Taylor, 1934).

HABITAT—Taylor (1934) reported two groups of this species that were roosting in dead leaves on small shrubs in lowland forest.

STATUS—Unknown.

Kerivoula whiteheadi Thomas, 1894. Ann. Mag. Nat. Hist., ser. 6, 14:460.

COMMON NAME—Whitehead's woolly bat.

DISTRIBUTION—Southern Thailand to Borneo and the Philippines; records are from Luzon (Isabela Province [BMNH]), Mindanao (Davao del Norte [FMNH], Davao del Sur [FMNH], and Zamboanga del Norte [FMNH] provinces), and Palawan (UMMZ). Also reported from Mindanao (Davao del Sur) by Sanborn (1952) and Panay by Taylor (1934).

HABITAT—Known only from near sea level, in disturbed forest and agricultural areas (Sanborn, 1952).

STATUS—Unknown.

Miniopterus australis Tomes, 1858. Proc. Zool. Soc. Lond. p. 125.

COMMON NAME—Little bent-winged bat.

DISTRIBUTION—India to Australia and throughout the Philippines except the Babuyan/Batanes group. Specimens from Bongao (UPLB), Bohol (USNM), Capiz (USNM), Catanduanes (USNM), Guimaras (FMNH), Leyte (USNM), Luzon (Bulacan [USNM] and Rizal [USNM] provinces), Mindanao (Davao del Norte [FMNH], Davao del Sur [FMNH], Maguindanao [FMNH], and Zamboanga del Norte [FMNH]), Negros (FMNH), Panay (FMNH), Polillo (FMNH), and Siquijor (SU).

HABITAT—Roosts in caves in lowland areas from sea level to about 200 m in agricultural areas or second growth (Heaney et al., 1991; Lepiten, 1995; Rickart et al., 1993; Sanborn, 1952; Taylor, 1934).

STATUS—Geographically widespread and common but dependent on caves.

COMMENT—Of the three size classes of bats of this genus that we have examined from the Philippines, all of the smallest class can be referred to a single species; all appear to be this species, rather than *M. pusillus* (Koopman, 1993).

Miniopterus schreibersi (Kuhl, 1817). Die Deutschen Fledermause, Hanau, p. 14.

COMMON NAME—Common bent-winged bat.

DISTRIBUTION—Europe to the Solomon Islands; throughout the Philippines. Specimens from Bohol (USNM), Catanduanes (USNM), Dalupiri (FMNH), Guimaras (FMNH), Leyte (USNM), Luzon (Cagayan [UMMZ], Camarines Sur [FMNH], Isabela [UMMZ], Pampanga [USNM], Rizal [USNM], and Tarlac [USNM] provinces), Mindanao (Bukidnon [FMNH], Davao del Sur [FMNH], and Zamboanga del Norte [FMNH] provinces), Negros (FMNH), Panay (FMNH), and Polillo (FMNH). Also reported from Cebu, Luzon (Benguet), Marinduque, Mindoro, and Tablas (Hollister, 1913; Lawrence, 1939; Sanborn, 1952; Taylor, 1934).

HABITAT—Common in caves throughout the lowlands in agricultural areas and in forest. Netted in primary forest from near sea level to 1450 m in lowland and montane forest; occasionally also use man-made tunnels (Heaney et al., 1991, in press; Lawrence, 1939; Rickart et al., 1993; Sanborn, 1952; Taylor 1934).

STATUS—Common and widespread, dependent on caves.

Miniopterus tristis (Waterhouse, 1845). Proc. Zool. Soc. Lond., p. 3.

COMMON NAME—Greater bent-winged bat.

DISTRIBUTION—Philippines to Solomon Islands; records throughout the Philippines, possibly excluding the Palawan Faunal Region. Recorded from Bohol (ROM), Guimaras (ROM), Leyte (USNM), Lubang (USNM), Mindanao (Maguindanao [FMNH] and Zamboanga del Norte [ROM] provinces), Negros (FMNH), and Tablas (ROM). Also reported from Cebu, Lubang, Luzon, Mindoro, and Samar (Hollister, 1912, 1913; Lawrence, 1939; Peterson, 1981; Taylor, 1934).

HABITAT—Apparently roost only in caves and forage in agricultural areas and disturbed lowland forest near sea level (Rickart et al., 1993; Sanborn, 1952).

STATUS—Moderately common and widespread, but dependent on caves.

Murina cyclotis Dobson, 1872. Proc. Asiat. Soc. Bengal, p. 210.

COMMON NAME—Round-eared tube-nosed bat.

DISTRIBUTION—Sri Lanka to Hainan and Borneo. In the Philippines, recorded from Biliran (UMMZ), Camiguin (MSU–IIT), Catanduanes (USNM), Luzon (Camarines Sur [USNM] Province), Mindanao (Bukidnon [FMNH] Province), Sibuyan (FMNH), and Siquijor (SU).

HABITAT—Primary lowland, lightly disturbed lowland, and lower montane forest from 250 m to 1500 m (Heaney et al., 1991, in press; Lepiten, 1995; Rickart et al., 1993; Ruedas et al., 1994).

STATUS—Widespread and moderately common in the Philippines.

Myotis horsefieldii (Temminck, 1840). Monogr. Mamm., 2:226.

COMMON NAME—Common Asiatic myotis.

DISTRIBUTION—Southeastern China to the Malay Peninsula, Bali, and Sulawesi. Philippine records are from Bohol (USNM), Catanduanes (FMNH), Luzon (Cagayan [FMNH], Laguna [CUVC], Pampanga [USNM], Quezon [UMMZ], and Rizal [USNM] provinces), Mindanao (Lanao del Norte Province [DMNH]), Negros (UMMZ), and Palawan (UMMZ).

HABITAT—In the Philippines, recorded in lowland forest and in agricultural areas from sea level to 800 m; sometimes roosts in caves and culverts and reported roosting beneath a large rock over a stream (Taylor, 1934).

STATUS—Widespread and moderately common; may depend on caves.

COMMENT—Includes *M. jeannei* (Hill, 1983).

Myotis macrotarsus (Waterhouse, 1845). Proc. Zool. Soc. Lond. p. 5.

COMMON NAME—Philippine large-footed myotis.

DISTRIBUTION—Borneo and the Philippines; probably throughout the Philppines. Specimens are from Guimaras (FMNH), Marinduque (FMNH), Mindanao (Lanao del Norte [USNM] Province), Negros (FMNH), Palawan (ANM), and Polillo (FMNH). Also reported from Luzon (Rizal Province), Marinduque, Mindanao (Zamboanga), and Tawi-tawi (Hollister, 1913; Lawrence, 1939; Taylor, 1934).

HABITAT—Roosts only in caves near sea level, forages in agricultural areas (Heaney & Utzurrum, unpubl. data).

STATUS—Uncommon, dependent on caves.

Myotis muricola (Gray, 1846). Cat. Hodgson Coll. Brit. Mus., p. 4.

COMMON NAME—Whiskered myotis.

DISTRIBUTION—Afghanistan to New Guinea; throughout the Philippines. Recorded from Biliran (UMMZ), Busuanga (FMNH), Culion (FMNH), Leyte (USNM), Luzon (Camarines Sur [USNM], Laguna [AMNH], and Rizal [AMNH] provinces), Mindanao (Bukidnon [FMNH] and South Cotabato [AMNH]), Maripipi (USNM), and Negros (FMNH).

HABITAT—In primary and secondary lowland and montane forest from near sea level to 1125 m (Rickart et al., 1993; Heaney et al., in press, unpubl. data).

STATUS—Common and widespread in Asia.

COMMENT—Includes *M. browni, M. herrei,* and *M. patriciae* (Koopman, 1993).

Myotis rufopictus (Waterhouse, 1845). Proc. Zool. Soc. Lond., p. 3, 8.

COMMON NAME—Orange-fingered myotis.

DISTRIBUTION—Philippines only; recorded on Luzon (Bulacan [USNM], Camarines Sur [USNM],

Isabela [UMMZ], Nueva Viscaya [UPLB], and Rizal [FMNH] provinces), Negros (UMNZ), Palawan (UMMZ), and Sibuyan (FMNH).

HABITAT—Recorded in primary lowland and montane forest from 50 m to 1125 m and in an agricultural area near sea level (Mudar & Allen, 1986; Heaney et al., in press, unpubl. data).

STATUS—Unknown, probably uncommon.

COMMENT—Considered to be a subspecies of *M. formosus* by Corbet and Hill (1992) and Koopman (1993), but we disagree on the basis of cranial and external morphology.

Philetor brachypterus (Temminck, 1840). Monogr. Mamm., 2:215.

COMMON NAME—Short-winged pipistrelle.

DISTRIBUTION—Nepal to New Guinea; throughout most of the Philippines. Recorded from Catanduanes (FMNH), Leyte (USNM), Luzon (Camarines Sur [USNM] and Laguna [CUVC]), Mindanao (Bukidnon [FMNH], Misamis Oriental [FMNH], and Zamboanga del Sur [DMNH]) provinces), and Negros (UMMZ) (Kock, 1981).

HABITAT—In primary and disturbed lowland forest from 475 m to 900 m (Rickart et al., 1993; Heaney et al., in press, unpubl. data).

STATUS—Uncertain; probably moderately common in primary forest.

Phoniscus jagori (Peters, 1866). Monatsb. K. Preuss. Akad. Wiss. Berlin, p. 399.

COMMON NAME—Common trumpet-eared bat.

DISTRIBUTION—Bali, Borneo, Java, Sulawesi, and Samar.

HABITAT—Unknown in Philippines.

STATUS—Unknown.

COMMENT—Koopman (1993) considered *Phoniscus* to be a subgenus of *Kerivoula.*

Pipstrellus javanicus (Gray, 1838). Mag. Zool. Bot., 2:498.

COMMON NAME—Javan pipistrelle.

DISTRIBUTION—Korea to Java and the Philippines; throughout the Philippines. Specimens from Camiguin (FMNH), Luzon (Benguet [FMNH], Cagayan [FMNH], Camarines Sur [FMNH], Isabela [FMNH], Laguna [FMNH], Quezon [UMZ], and Rizal [FMNH] provinces), Mindanao (Bukidnon [FMNH] and Davao del Sur [FMNH] provinces), Mindoro (FMNH), Negros (FMNH), Palawan (FMNH), Panay (USNM), Reinhard (UMMZ), and Sibuyan (FMNH).

HABITAT—Common in primary montane forest, uncommon in primary lowland and mossy forest, from sea level to 1750 m (Sanborn, 1952; Heaney et al., in press, unpubl. data).

STATUS—Moderately common and widespread in eastern Asia.

COMMENT—Previous reports of *P. imbricatus* from the Philippines all appear to be based on specimens of this species.

Pipistrellus petersi (Meyer, 1899). Abh. Zool. Anthrop.-Ethnology. Mus. Dresden, 7(7):13.

COMMON NAME—North Wallacean pipistrelle.

DISTRIBUTION—Sulawesi, Molucca Islands, and the Philippines; records from Luzon (Benguet Province [USNM]) and Mindanao (Davao del Sur [FMNH] and Surigao del Norte [AMNH] provinces).

HABITAT—Unknown.

STATUS—Unknown.

Pipistrellus stenopterus (Dobson, 1875). Proc. Zool. Soc. Lond. p. 470.

COMMON NAME—Narrow-winged pipistrelle.

DISTRIBUTION—Sumatra to Mindanao; the single Philippine specimen is from Mindanao (Zamboanga del Sur Province [USNM]).

HABITAT—Unknown in the Philippines; reported to roost in houses and feed over open fields on Borneo (Payne et al., 1985).

STATUS—Unknown.

Pipistrellus tenuis (Temminck, 1840). Monogr. Mamm., 2:229.

COMMON NAME—Least pipistrelle.

DISTRIBUTION—Thailand to Australia; Philippine records from Luzon (Rizal [USNM]), Negros (FMNH), and Sibuyan (FMNH). Also reported from Mindanao by Taylor (1934).

HABITAT—Primary lowland and montane forest from 800 m to 1700 m (Heaney et al., unpubl. data).

STATUS—Widespread and moderately common.

Scotophilus kuhlii Leach, 1821. Trans. Linn. Soc. Lond. 13:71.

COMMON NAME—Lesser Asian house bat.

DISTRIBUTION—Pakistan to Taiwan and Bali. This species is found throughout the Philippines. Recorded from Biliran (USNM), Catanduanes (USNM), Cuyo (FMNH), Guimaras (USNM), Leyte (FMNH), Luzon (Bulacan [FMNH], Cagayan [UMMZ], Cavite [USNM], Isabela [FMNH], Laguna [UPLB], La Union [USNM], Pampanga [FMNH], Rizal [FMNH], and Zambales [USNM] provinces), Maripipi (USNM), Mindanao (Davao del Sur [FMNH], Lanao del Norte [USNM], Maguindanao [FMNH], Misamis Oriental [UPLB], and South Cotabato [FMNH] provinces), Negros (FMNH), Palawan (FMNH), Panay (FMNH), Sibuyan (FMNH), and Ticao (USNM). Also reported from Cebu and Luzon (Abra) (Lawrence, 1939; Taylor, 1934). Also reported from Carabao Island (Alcala & Alviola, 1970).

HABITAT—Commonly roost in buildings and in "tents" formed from modified palm fronds. They forage in urban and agricultural areas and secondary forest from sea level to about 600 m (Rickart et al., 1989b, 1993; Heaney et al., unpubl. data).

STATUS—Abundant in urban and agricultural areas.

Tylonycteris pachypus (Temminck, 1840). Monogr. Mamm., 2:217.

COMMON NAME—Lesser flat-headed bat, Lesser bamboo bat.

DISTRIBUTION—India to the Philippines and Lesser Sunda Islands; probably throughout the Philippines. Recorded from Calauit (UMMZ), Culion (FMNH), Luzon (Rizal Province [USNM]), and Palawan (USNM).

HABITAT—Bamboo stands in lowland agricultural areas.

STATUS—Widespread, probably moderately common.

Tylonycteris robustula Thomas, 1915. Ann. Mag. Nat. Hist., ser. 8, 15:227.

COMMON NAME—Greater flat-headed bat, Greater bamboo bat.

DISTRIBUTION—Southern China to the Lesser Sunda Islands and Philippines; recorded from Luzon (Rizal [USNM] and Zambales [UPD] provinces), Calauit (UMMZ), and Palawan (USNM).

HABITAT—Disturbed lowland regions with bamboo stands (Heaney & Alcala, 1986).

STATUS—Widespread, status unknown in Philippines.

COMMENT—First reported from the Philippines by Heaney and Alcala (1986).

Molossidae—Free-tailed Bats

None of the four species of this family in the Philippines (Fig. 5E) is endemic; all are poorly known.

Chaerephon plicata (Buchanan, 1800). Trans. Linn. Soc. Lond. 5:261.

COMMON NAME—Wrinkle-lipped bat.

DISTRIBUTION—India to Bali and Hainan. Philippine records are from Cebu (UMMZ), Leyte (ROM), Luzon (Cagayan [USNM], Isabela [FMNH], Pampanga [USNM], and Rizal [FMNH] provinces), and Negros (ROM). Also reported from Mindanao (Cotabato) by Taylor (1934).

HABITAT—Recorded only in caves from sea level to about 200 m, probably requires forested habitat.

STATUS—Probably vulnerable and declining. Formerly among the most abundant bats in some large caves (Lawrence, 1939; Taylor, 1934); some previously recorded colonies in caves are now destroyed (Rickart et al., 1993). Reported since 1980 only from northern Luzon (Danielsen et al., 1994).

COMMENT—Includes *C. luzonus* (Hill, 1961).

Cheiromeles parvidens Miller and Hollister, 1921. Proc. Biol. Soc. Washington, 34:100.

COMMON NAME—Lesser naked bat.

DISTRIBUTION—Sulawesi and the Philippines; reported from Mindanao (Davao del Sur [UPLB], Misamis Oriental [UPLB], and South Cotabato [AMNH] provinces), and Negros (ROM). Also reported from Mindoro by Lawrence (1939).

HABITAT—Poorly known, but probably in agricultural areas from sea level to 200 m. Often roost in hollow trees (Rabor, 1986; Taylor, 1934).

STATUS—Unknown.

COMMENT—We recognize this as a morphologically distinctive species (Ingle & Heaney, 1992).

in contrast to Koopman (1993), who considers it a synonym of *C. torquatus.*

Cheiromeles torquatus Horsfield, 1824. Zool. Res. Java, part 8.

COMMON NAME—Greater naked bat.

DISTRIBUTION—Sumatra to Java; within the Philippines, restricted to Palawan (FMNH).

HABITAT—Unknown in the Philippines. On Borneo, reported to roost in large caves and hollow trees and to feed both in open areas over streams and clearings and above forest canopy (Payne et al., 1985).

STATUS—Unknown.

Mops sarasinorum (Meyer, 1899). Abh. Zool. Anthrop.-Ethnology, Mus. Dresden, 7(7):15.

COMMON NAME—Sulawesi mastiff bat.

DISTRIBUTION—Sulawesi and the Philippines; records are from Luzon (Benguet [FMNH]), Mindanao (South Cotabato [AMNH] and Misamis Oriental [SU] provinces), and Palawan (SMF) only.

HABITAT—Poorly known; probably found in lowland forest.

STATUS—Unknown.

COMMENT—Freeman (1981) listed *Philippinopterus* as a synonym of *Mops,* and *P. lanei* as a subspecies of *Mops sarasinorum.*

Primates

Loridae—Lorises and Coucangs

A single species of this family barely enters the Philippines.

Nycticebus coucang Boddaert, 1785. Elench. Anim., p. 67.

COMMON NAME—Slow loris.

DISTRIBUTION—India to Borneo and the Philippines; records are from the Sulu Archipelago only (Musser & Heaney, 1985; Timm & Birney, 1980). Specimen from Mindanao (Misamis Occidental [USNM]) probably is an error (Fooden, 1991a). Reliable records from Bongao (UPLB), Sanga-sanga, Simunul, Tawi-tawi (see Timm & Birney, 1992; Fooden, 1991a).

HABITAT—Primary and secondary lowland forest, gardens, and plantations (Timm & Birney, 1992; Payne et al., 1985).

STATUS—Widespread in Asia, but very limited in the Philippines (Dagosto & Gebo, 1995). CITES: Appendix II.

Tarsiidae—Tarsiers

A single species in this family occurs in the Philippines.

Tarsius syrichta (Linnaeus, 1758). Syst. Nat., 10th ed., 1:29.

COMMON NAME—Philippine tarsier.

DISTRIBUTION—Philippines only. Records are from Bohol (USNM), Dinagat (DMNH), Leyte (USNM), Mindanao (Davao del Norte [FMNH], Davao del Sur [FMNH], Misamis Occidental [USNM], Misamis Oriental [MSU], South Cotabato [FMNH], Zamboanga del Norte [FMNH], and Zamboanga del Sur [USNM] provinces), and Samar (FMNH). Also reported from Basilan (Lawrence, 1939), Biliran, Maripipi (Rickart et al., 1993), and Mindanao (Bukidnon) (Sanborn, 1953).

HABITAT—Second growth, secondary forest, and primary forest from sea level to 700 m (Hoogstraal, 1951; Rabor, 1986; Rickart et al., 1993; Thomas, 1898).

STATUS—Locally common and widespread, largely because of its tolerance of second growth habitat (Dagosto & Gebo, 1995). CITES: Appendix II.

COMMENT—Reviewed by Musser and Dagosto (1987). Physiological studies have been conducted by McNab and Wright (1987).

Cercopithecidae—Monkeys

A single species of monkey occurs in the Philippines, but is quite widespread (Fooden, 1991b).

Macaca fascicularis (Raffles, 1821). Trans. Linn. Soc. Lond. 13:246.

COMMON NAME—Long-tailed macaque.

DISTRIBUTION—Burma to Timor; throughout the

Philippines (Fooden, 1991b). Specimens from Balabac (USNM), Basilan (USNM), Baslut (USNM), Biliran (USNM), Bohol (FMNH), Busuanga (FMNH), Cagayan Sulu (USNM), Culion (FMNH), Jolo (USNM), Leyte (USNM), Luzon (Abra [FMNH], Batangas [USNM], Cagayan [USNM], Camarines Sur [FMNH], Ilocos Norte [USNM], Isabela [AMNH], and Laguna [AMNH]), Maripipi (USNM), Mindanao (Davao del Norte [FMNH], Davao del Sur [FMNH], Lanao del Norte [USNM], Maguindanao [FMNH], Misamis Occidental [FMNH], Zamboanga del Norte [FMNH], and Zamboanga del Sur [FMNH] provinces), Mindoro (USNM), Negros (FMNH), Palawan (FMNH), Samar (FMNH), and Sibuyan (FMNH). Also reported from Culion, Mindanao (Davao Oriental and Maguindanao) (Sanborn, 1952; Lawrence, 1939), Mindanao (Agusan del Norte) (Sanborn, 1953), Catanduanes (Heaney et al., 1991), Camiguin (Heaney & Tabarazan, 1995), Panay (Lastimosa, pers. comm.), and Aurora, Quezon, and Zambales provinces, Luzon (Ong, pers. obs.).

HABITAT—Agricultural areas near forest, second growth, secondary forest, and primary forest from sea level to at least 1800 m in lowland and montane forest (Dagosto & Gebo, 1995; Danielsen et al., 1994; Fooden, 1991b, 1995; Goodman & Ingle, 1993; Heaney et al., 1991, in press; Rabor, 1986; Rickart et al., 1993; Thomas, 1898).

STATUS—Widespread in Asia. In the Philippines, locally common to uncommon and hunted heavily. CITES: Appendix II.

COMMENT—Geographic variation and systematics have been reviewed by Fooden (1991b, 1995).

Pholidota

Manidae—Pangolins

A single species of this distinctive family is known from the Philippines.

Manis javanica Desmarest, 1822. Mammalogie, *In* Encycl. Méth. 2:377.

COMMON NAME—Malayan pangolin.

DISTRIBUTION—Burma to Java, and the Philippines. Philippine records from Palawan Faunal Region only, Palawan (FMNH) and Culion (Elera, 1915).

HABITAT—Primary and secondary lowland forest, sometimes localized in distribution (Hoogstraal, 1951).

STATUS—Uncommon, heavily hunted and probably seriously endangered in the Philippines.

Rodentia

Sciuridae—Squirrels

All nine species of squirrels from the Philippines are endemic; six species are confined to the Palawan Faunal Region, and the remaining three to the Mindanao Faunal Region. A representative species is shown in Figure 4C. *Hylopetes mindanensis* is considered to be a synonym of *Petinomys crinitus* (Hoffmann et al., 1993), and *Sundasciurus davensis, S. mindanensis,* and *S. samarensis* are considered to be synonyms of *S. philippinensis* (Corbet & Hill, 1992).

Exilisciurus concinnus (Thomas, 1888). Ann. Mag. Nat. Hist., ser. 6, 6:407.

COMMON NAME—Philippine pygmy squirrel.

DISTRIBUTION—Endemic to the Mindanao Faunal Region. Recorded from the islands of Basilan (FMNH), Biliran (USNM), Bohol (FMNH), Dinagat (USNM), Leyte (UMMZ), Mindanao (Agusan del Norte [UPLB], Bukidnon [FMNH], Davao del Sur [FMNH], Davao Oriental [DMNH], Lanao del Norte [DMNH], Lanao del Sur [DMNH], Maguindanao [FMNH], Misamis Occidental [FMNH], South Cotabato [FMNH], Surigao del Norte [DMNH], Zamboanga del Norte [FMNH], and Zamboanga del Sur [DMNH] provinces), Samar (FMNH), and Siargao (DMNH).

HABITAT—From sea level to 2000 m, in lowland and montane primary and secondary forest, probably most abundant in small clearings at middle elevations (Heaney, 1985a; Rabor, 1986; Rickart et al., 1993).

STATUS—Widespread, moderately common.

COMMENT—Revised by Heaney (1985a).

Hylopetes nigripes (Thomas, 1893). Ann. Mag. Nat. Hist., ser. 6, 12:30.

COMMON NAME—Palawan flying squirrel.

DISTRIBUTION—Palawan Faunal Region only.

Recorded on Bancalan (FMNH) and Palawan Island (FMNH, USNM).

HABITAT—Primary and secondary lowland forest, where they nest in cavities in large trees (Taylor, 1934).

STATUS—Moderately common.

Petinomys crinitus Hollister, 1911. Proc. Biol. Soc. Washington, 24:185.

COMMON NAME—Mindanao flying squirrel.

DISTRIBUTION—Mindanao Faunal Region only. There are records from Basilan (USNM), Dinagat (DMNH), Mindanao (Bukidnon [FMNH], Davao del Sur [DMNH], Lanao del Sur [DMNH], Misamis Occidental [FMNH], Misamis Oriental [DMNH], and Zamboanga del Norte [UPLB] provinces), and Siargao (DMNH).

HABITAT—Primary lowland forest from 500 m to 1600 m, most abundant at middle elevations (Musser and Heaney, 1992).

STATUS—Moderately common in midelevation primary forest.

COMMENT—Includes *Hylopetes mindanensis* (Corbet & Hill, 1992; Hoffmann et al., 1993).

Sundasciurus hoogstraali (Sanborn, 1952). Fieldiana Zool., 33:115.

COMMON NAME—Busuanga tree squirrel.

DISTRIBUTION—Palawan Faunal Region. Recorded only from the islands of Busuanga (FMNH) and Calauit (UMMZ).

HABITAT—Primary and secondary lowland forest (Hoogstraal, 1951).

STATUS—Locally common.

Sundasciurus juvencus (Thomas, 1908). Ann. Mag. Nat. Hist., ser. 8, 2:498.

COMMON NAME—Northern Palawan tree squirrel.

DISTRIBUTION—Palawan Faunal Region. Recorded from central (north of Abo-abo) and northern Palawan Island only.

HABITAT—Primary and secondary lowland forest (Hoogstraal, 1951).

STATUS—Locally common, stable. IUCN: Endangered (but we recommend delisting).

Sundasciurus moellendorffi (Matschie, 1898). Sitzb. Gesell. Naturf. Fr., Berlin, 5:41.

COMMON NAME—Culion tree squirrel.

DISTRIBUTION—Palawan Faunal Region only. Records are from Culion (FMNH), Linapacan (PNM), Iloc (PNM), and Tampel (PNM) islands only.

HABITAT—In primary and secondary lowland forest and coconut groves (Hoogstraal, 1951; Sanborn, 1952).

STATUS—Locally abundant.

COMMENT—Currently includes *S. albicauda* Matschie 1898, which is reported from Culion Island, but further study is needed (Heaney, 1979; Gonzales, unpubl. data).

Sundasciurus philippinensis (Waterhouse, 1839). Proc. Zool. Soc. Lond., p. 117.

COMMON NAME—Philippine tree squirrel.

DISTRIBUTION—Philippines only, where it is found on Mindanao and adjacent islands. Recorded from Basilan (MCZ), Biliran (USNM), Bohol (FMNH), Dinagat (USNM), Leyte (FMNH), Mindanao (Agusan del Norte [UPLB], Davao del Norte [FMNH], Davao del Sur [FMNH], Davao Oriental [UPLB], Lanao del Norte [DMNH], Lanao del Sur [DMNH], Maguindanao [FMNH], Misamis Occidental [FMNH], Misamis Oriental [DMNH], South Cotabato [UPLB], Surigao del Sur [UPLB], Zamboanga del Norte [FMNH], and Zamboanga del Sur [DMNH] provinces), Samar (FMNH), and Siargao (DMNH).

HABITAT—In primary and secondary lowland and montane forest from near sea level to at least 2100 m, often most abundant near agricultural fields (Rickart et al., 1993; Sanborn, 1952).

STATUS—Locally common in forested regions.

COMMENT—Corbet and Hill (1992) synonymized *Sundasciurus davensis, S. mindanensis,* and *S. samarensis* with *S. philippinensis.* IUCN: Listed *S. samarensis* as vulnerable, but recent taxonomic changes make this invalid.

Sundasciurus rabori Heaney, 1979. Proc. Biol. Soc. Washington, 92:281.

COMMON NAME—Palawan montane tree squirrel.

DISTRIBUTION—Palawan Island only (PNM).

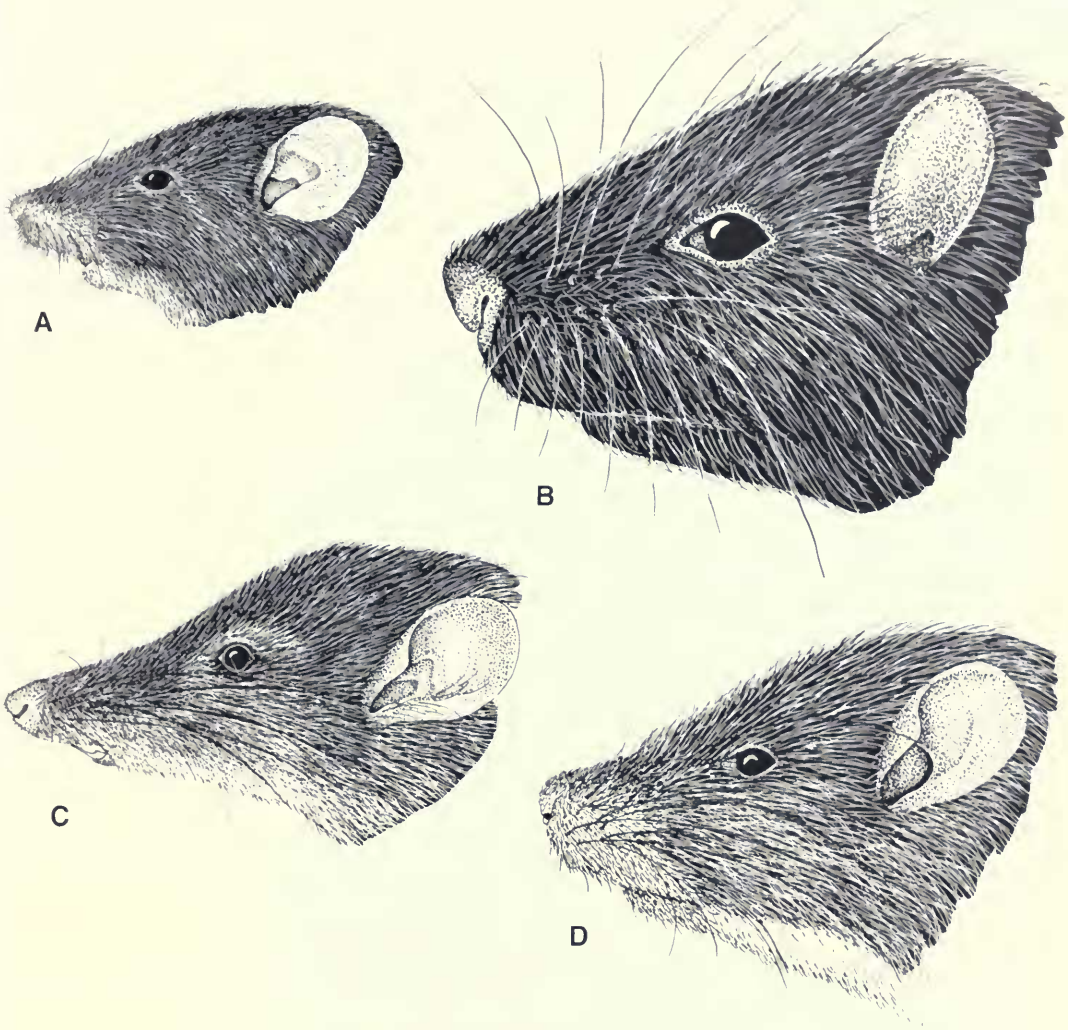

FIG. 6. Heads of representative murid rodents from Luzon (not to the same scale). **A**, *Archboldomys luzonensis*. **B**, *Phloeomys cumingi*. **C**, *Rhynchomys isarogensis*. **D**, *Rattus everetti*.

HABITAT—Recorded in mountains on Palawan from 110 m to 1300 m.

STATUS—Moderately common but geographically restricted and probably confined to upper elevation forest. IUCN: Vulnerable.

Sundasciurus steerii (Günther, 1877). Proc. Zool. Soc. Lond. [1876] p. 735.

COMMON NAME—Southern Palawan tree squirrel.

DISTRIBUTION—Palawan Faunal Region only. Records are from Balabac (USNM), Bancalan (FMNH), Matangule (FMNH), and southern Palawan (Brooke's Point Municipality; FMNH) islands only.

HABITAT—Lowland forest, coconut groves, and banana plantations.

STATUS—Common and stable.

Muridae—Mice and Rats

Philippine murids are a remarkably diverse group of animals, ranging from small, ground-living shrew-like animals to large arboreal animals with flowing black hair (some examples are shown in Figs. 4D and 6). An astounding 14 new

species of Philippine murid rodents have been discovered since the last checklist was published in 1987. The genus *Apomys* includes the most new species, with two undescribed species from Sibuyan (Goodman & Ingle, 1993), one undescribed species from Negros (Heaney, unpubl. data), one from Mindoro (Dans et al., unpubl. data), and one from Camiguin (Heaney & Tabaranza, unpubl. data), as well as the recently described *Apomys gracilirostris* from Mindoro (Ruedas, 1995). The other additions are an undescribed *Archboldomys* from northern Luzon (Rickart et al., 1998), an undescribed *Bullimus* from Camiguin (Heaney & Tabaranza, 1997), *Chrotomys gonzalesi* from Mt. Isarog, an undescribed *Chrotomys* from Sibuyan, *Crateromys heaneyi* from Panay (Gonzales & Kennedy, 1996), undescribed *Crunomys* (Rickart et al., 1998) and *Tarsomys* from Mt. Kitanglad (Heaney et al., unpubl. data), *Tarsomys echinatus* from Mindanao (Musser & Heaney, 1992), and an undescribed *Tarsomys* from Sibuyan (Goodman & Ingle, 1993). In addition, two undescribed species previously known (*Batomys* from Dinagat [Musser et al., in press] and *Haeromys* from Palawan [Heaney et al., 1987]) are curently under study (Musser et al., unpubl. data).

The systematics and relationships of Philippine murid genera were reviewed by Musser and Heaney (1992). Chromosomal variation in Philippine murids was described by Rickart and Musser (1993). The species formerly referred to as *Rattus rattus* is now recognized as a species group, and Philippine populations have been placed in the species *Rattus tanezumi* (Musser & Carleton, 1993). *Bullimus rabori* and *Rattus tyrannus* are now considered to be junior synonyms of *Bullimus bagobus* and *Rattus everetti,* respectively (Musser & Carleton, 1993; Musser & Heaney, 1992). *Crunomys rabori* is now considered to be a synonym of *C. melanius* (Musser & Heaney, 1992; Rickart et al., unpubl. data).

Abditomys latidens (Sanborn, 1952). Fieldiana Zool., 33:125.

COMMON NAME—Luzon broad-toothed rat.

DISTRIBUTION—Luzon Faunal Region. Apparently endemic to central and northern Luzon Island (Laguna [USNM] and Mountain [FMNH] provinces).

HABITAT—Very poorly known. Taken in densely vegetated gullies in pine forest at about 2250 m (Rabor, 1955, 1986; Sanborn, 1952) and in second growth in the lowlands at about 75 m (Barbehenn et al., 1973; Musser, 1982a).

STATUS—Uncertain.

Anonymomys mindorensis Musser, 1981. Bull. Am. Mus. Nat. Hist., 168:300.

COMMON NAME—Mindoro climbing rat.

DISTRIBUTION—Endemic to Mindoro (FMNH) and known only from Ilong Peak, Halcon Range.

HABITAT—Poorly known; taken in forest at 1400 m (Musser, 1981).

STATUS—Uncertain; geographically restricted to an island that has been heavily deforested. It may be vulnerable to further deforestation (Heaney & Utzurrum, 1991). IUCN: Vulnerable.

Apomys abrae (Sanborn, 1952). Fieldiana Zool., 33(2):133.

COMMON NAME—Luzon Cordillera forest mouse.

DISTRIBUTION—Endemic to the Central Cordillera of northern Luzon (Abra [FMNH], Benguet [FMNH], Ilocos Norte [FMNH], and Mountain [FMNH] provinces).

HABITAT—Moderately common in primary forest and second growth from ca. 1000 m to 2000 m, occasionally to 2500 m (Musser, 1982c; Rabor, 1955; Sanborn, 1952).

STATUS—Probably stable.

COMMENT—The genus *Apomys* was reviewed by Musser (1982c), with modifications by Musser and Heaney (1992).

Apomys datae (Meyer, 1899). Abh. Mus. Dresden, ser. 7, 7:25.

COMMON NAME—Luzon montane forest mouse.

DISTRIBUTION—Endemic to northern Luzon (Benguet [USNM], Cagayan [FMNH], Ilocos Norte [SU], Isabela [PNM], and Mountain [FMNH] provinces).

HABITAT—Recorded in primary montane and mossy forest from 760-m to 1650-m elevation in the Sierra Madre (Danielsen et al., 1994; Mallari & Jensen, 1993) and from 1600 m to 2500 m in montane and mossy forest in the Central Cordillera (Musser, 1982b; Rabor, 1955; Sanborn, 1952).

STATUS—Moderately common and widespread.

Apomys gracilirostris Ruedas, 1995. Proc. Biol. Soc. Washington, 108:305.

COMMON NAME—Large Mindoro forest mouse.

DISTRIBUTION—Known only from Mindoro (Ruedas, 1995).

HABITAT—Recorded from 1255 m to 1900 m in primary montane forest and natural bamboo thicket (Ruedas, 1995).

STATUS—Locally common, but seriously threatened by extensive habitat loss (Ruedas, 1995). IUCN: Vulnerable.

Apomys hylocoetes Mearns, 1905. Proc. U.S. Natl. Mus., 28:456.

COMMON NAME—Mindanao mossy forest mouse.

DISTRIBUTION—Endemic to Mindanao (Bukidnon [FMNH] and Davao del Sur [USNM] provinces).

HABITAT—Uncommon in primary montane forest at 1900 m and abundant in primary mossy forest from 2250 m to 2800 m (Musser, 1982c; Heaney et al., unpubl. data). Probably widespread on the high peaks of Mindanao.

STATUS—Stable and probably moderately widespread.

Apomys insignis Mearns, 1905. Proc. U.S. Natl. Mus., 28:459.

COMMON NAME—Mindanao montane forest mouse.

DISTRIBUTION—Endemic to the Mindanao Faunal Region: Dinagat (DMNH) and Mindanao (Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Misamis Oriental [FMNH], Misamis Occidental [FMNH], and Zamboanga del Norte [AMNH] provinces). Also reported from Mindanao (Agusan del Norte) (Sanborn, 1953).

HABITAT—In primary and secondary forest from 900 m to 2800 m (Musser & Heaney, 1992). On Mt. Kitanglad, absent from lowland forest (1100 m), uncommon in lower montane forest (1600 m), abundant in upper montane forest (1800 m) and transitional montane-mossy forest (1900 m), and absent in mossy forest (2250–2800 m) (Heaney et al., unpubl. data).

STATUS—Stable and widespread.

Apomys littoralis (Sanborn, 1952). Fieldiana Zool., 33(2):134.

COMMON NAME—Mindanao lowland forest mouse.

DISTRIBUTION—Endemic to the Mindanao Faunal Region: Biliran (USNM), Bohol (USNM), Leyte (USNM), and Mindanao (Lanao del Sur [DMNH] and Maguindanao [FMNH] provinces).

HABITAT—The holotype was taken on the coastal plain of northern Cotabato (now Maguindanao) Province. An additional specimen taken at about 1400 m in Lanao del Sur was tentatively referred to this species (Musser, 1982c). Mice tentatively referred to this species were common on Leyte in primary montane and mossy forest and on Biliran in montane forest and were rare in lowland forest on Leyte and Bohol (Heaney et al., 1989; Rickart et al., 1993; Heaney et al., unpubl. data). Specimens initially referred to this species from Negros (Musser, 1982c) are an undescribed species (Musser & Heaney, 1992) listed here as *Apomys* sp. A.

STATUS—Uncertain because of taxonomic uncertainty.

Apomys microdon Hollister, 1913. Proc. U.S. Natl. Mus., 46:327.

COMMON NAME—Small Luzon forest mouse.

DISTRIBUTION—Endemic to the Luzon Faunal Region: Catanduanes (USNM) and Luzon (Camarines Sur [USNM] and Isabela [FMNH] provinces).

HABITAT—Uncommon on Mt. Isarog, where they were captured in secondary lowland forest and primary montane forest from 475 m to 1550 m (Heaney et al., in press; Rickart et al., 1991). They were also taken in forest near sea level in Isabela Province (Danielsen et al., 1994) and on Catanduanes (Hollister, 1913). The species is virtually unknown elsewhere (Heaney et al., 1991; Mallari & Jensen, 1993).

STATUS—Uncertain; probably widespread and stable, but deforestation has removed much of its habitat.

COMMENT—Corbet and Hill (1992) stated that *A. hollisteri* should be used for this species, but Musser and Carleton (1993) continued usage of *A. microdon*.

Apomys musculus Miller, 1911. Proc. U.S. Natl. Mus., 38:403.

COMMON NAME—Least Philippine forest mouse.

DISTRIBUTION—Endemic to Dinagat (FMNH) and Luzon (Benguet [USNM], Camarines Sur [FMNH], and Isabela [FMNH] provinces), and Mindoro (FMNH).

HABITAT—Abundant in primary montane forest (1125–1350 m), uncommon in mossy forest (1550–1750 m), and absent in disturbed lowland forest (475–900 m) on Mt. Isarog, southern Luzon (Balete & Heaney, in press; Heaney et al., in press; Rickart et al., 1991). Recorded in disturbed lowland forest at 300 m in northeastern Luzon (Danielsen et al., 1994; Mallari & Jensen, 1993) and at 1500 m in Benguet (Miller, 1910) and in ridgetop mossy forest at 750 m on Dinagat (Tabaranza, unpubl. data).

STATUS—Apparently widespread and moderately common at medium elevations.

Apomys sacobianus Johnson, 1962. Proc. Biol. Soc. Washington, 75:318.

COMMON NAME—Long-nosed Luzon forest mouse.

DISTRIBUTION—Endemic to Luzon (Isabela [FMNH], Mountain [USNM], Pampanga [USNM], and Zambales [PNM] provinces).

HABITAT—Poorly known, but it apparently occurs in primary forest from about 200 m to 1100 m (Danielsen et al., 1994; Johnson, 1962; Mallari & Jensen, 1993; Musser, 1982c).

STATUS—Uncertain. The available data indicate that it is widespread in northern and central Luzon. IUCN: Vulnerable (but we consider this listing to be premature, given the current lack of knowledge).

Apomys sp. A

COMMON NAME—Western Visayan forest mouse.

DISTRIBUTION—Known only from Negros (USNM) and Panay (PNM).

HABITAT—Montane and mossy primary forest from 800 m to 1600 m (Heaney et al., 1989; Heideman et al., 1987; Rabor et al., 1970).

STATUS—Locally common in upland forest but seriously threatened by habitat loss.

Apomys sp. B

COMMON NAME—Greater Sibuyan forest mouse.

DISTRIBUTION—Sibuyan only (FMNH; Goodman & Ingle, 1993).

HABITAT—Primary forest from 325 m to 1325 m (Goodman & Ingle, 1993; specimens in FMNH).

STATUS—Locally common, but habitat is limited and declining (Goodman & Ingle, 1993).

Apomys sp. C

COMMON NAME—Lesser Sibuyan forest mouse.

DISTRIBUTION—Sibuyan only (Goodman & Ingle, 1993).

HABITAT—Primary forest from 30 m to 325 m (Goodman & Ingle, 1993; specimens in FMNH).

STATUS—Locally abundant, but habitat is very limited and declining (Goodman & Ingle, 1993).

Apomys sp. D

COMMON NAME—Camiguin forest mouse.

DISTRIBUTION—Camiguin Island only (FMNH).

HABITAT—Primary montane forest from 1000 m to 1275 m (Heaney & Tabaranza, 1997).

STATUS—Locally common and stable but confined to a very small area that is threatened by deforestation (Heaney & Tabaranza, 1997).

Apomys sp. E

COMMON NAME—Lesser Mindoro forest mouse.

DISTRIBUTION—Mindoro Island only (UPLB).

HABITAT—Unknown.

STATUS—Unknown.

COMMENT—Currently under study by Dans et al. (unpubl. data).

Archboldomys luzonensis Musser, 1982. Bull. Am. Mus. Nat. Hist., 174:30.

COMMON NAME—Isarog shrew-mouse.

DISTRIBUTION—Endemic to Mt. Isarog, Camarines Sur Province, Luzon (FMNH).

HABITAT—Moderately common in primary montane and mossy forest from 1350 m to 1750 m (Balete & Heaney, in press; Heaney et al., in

press; Rickart et al., 1991). Holotype stated to be from approximately 750 m (Musser, 1982c).

STATUS—Population stable but highly restricted in distribution, threatened by habitat destruction (Heaney & Utzurrum, 1991). IUCN: Endangered.

Archboldomys sp. A

COMMON NAME—Palanan shrew-mouse.

DISTRIBUTION—Known only from Mt. Cetaceo, Cagayan Province, Luzon (FMNH).

HABITAT—Mossy forest at 1650 m (Danielsen et al., 1994).

STATUS—Unknown.

COMMENT—Mistakenly identified by Heaney as *Crunomys fallax* in Danielsen et al. (1994). Currently being described by Rickart et al. (1998).

Batomys dentatus Miller, 1910. Proc. U.S. Natl. Mus., 38:400.

COMMON NAME—Large-toothed hairy-tailed rat.

DISTRIBUTION—Known only from Benguet Province (USNM), Luzon.

HABITAT—The single known specimen was taken at ca. 2100 m, probably in montane forest (Miller, 1910).

STATUS—Unknown.

Batomys granti Thomas, 1895. Ann. Mag. Nat. Hist., ser. 6, 16:162.

COMMON NAME—Luzon hairy-tailed rat.

DISTRIBUTION—Luzon Faunal Region; known only from Mt. Data, Benguet Province (FMNH) and Mt. Isarog, Camarines Sur Province (FMNH).

HABITAT—Uncommon in montane forest and common in mossy forest on Mt. Isarog (Balete & Heaney, in press; Heaney et al., in press; Rickart et al., 1991). Found in thick vegetation on the ground in mossy forest at ca. 2100 m in the Central Cordillera (Rabor, 1955; Sanborn, 1952; Thomas, 1898).

STATUS—Probably widespread and moderately common at higher elevations.

Batomys salomonseni (Sanborn, 1953). Vidensk. Medd. Nat. Foren. Kjobenhavn, 115:287.

COMMON NAME—Mindanao hairy-tailed rat.

DISTRIBUTION—Mindanao Faunal Region. Records are from Biliran (USNM), Dinagat (MS [illegible]), Leyte (USNM), and Mindanao (Bukidnon [FMNH]).

HABITAT—On Leyte, common in montane and ridgetop mossy primary forest from 700 m to 950 m and uncommon at 500 m in lowland forest (Heaney et al., 1989; Rickart et al., 1993). On Mt. Kitanglad, Mindanao, moderately common in montane and mossy forest from 1600 m to 2375 m (Heaney et al., unpubl. data).

STATUS—Probably widespread and common in primary montane and mossy forest.

COMMENT—*Mindanaomys* is considered to be a synonym of *Batomys* (Musser & Heaney, 1992).

Batomys sp. A

COMMON NAME—Dinagat hairy-tailed rat.

DISTRIBUTION—Known only from Dinagat Island (DMNH) (Heaney and Rabor, 1982).

HABITAT—Disturbed lowland forest at ca. 350 m (Musser et al., unpubl. data).

STATUS—Unknown; geographically restricted and habitat subject to destruction.

COMMENT—Currently being described by Musser et al. (in press).

Bullimus bagobus Mearns, 1905. Proc. U.S. Natl. Mus., 28:450.

COMMON NAME—Large Mindanao forest rat.

DISTRIBUTION—Widespread in Mindanao Faunal Region; records from Bohol (FMNH), Dinagat (DMNH), Leyte (USNM), Maripipi (USNM), Mindanao (Agusan del Norte [DMNH], Davao del Sur [FMNH], Lanao del Norte [UPLB], Lanao del Sur [UPLB], Misamis Occidental [FMNH], Misamis Oriental [UPLB], South Cotabato [AMNH], Surigao del Sur [UPLB], and Zamboanga del Norte [FMNH] provinces), Samar (USNM), and Siargao (DMNH).

HABITAT—Recorded from ca. 200 m to 1800 m on Mindanao (Musser & Heaney, 1992), mostly in lowland forest though occasionally in mossy forest (Sanborn, 1952), from 300 m to 500 m in lowland forest on Leyte, and in montane forest at 740 m on Maripipi (Rickart et al., 1993).

STATUS—Common and widespread.

COMMENT—The genus *Bullimus* was recognized and defined by Musser (1982c) and Musser and Heaney (1992). Includes *Bullimus rabori* (Musser, 1982c; Musser & Carleton, 1993; Musser & Heaney, 1992).

Bullimus luzonicus (Thomas, 1895). Ann. Mag. Nat. Hist., ser. 6, 16:163.

COMMON NAME—Large Luzon forest rat.

DISTRIBUTION—Known only from Luzon (Aurora [UPD], Benguet (FMNH), and Camarines Sur [FSM] provinces).

HABITAT—Poorly known. Scattered specimens taken in mixed primary and distubed lowland forest from about 200 m to 2400 m in montane and mossy forest (Largen, 1985; Musser, 1982c; Rabor, 1955; Sanborn, 1952; Thomas, 1898; Heaney et al., in press).

STATUS—Uncertain; may be moderately common in primary lowland forest.

Bullimus sp. A

COMMON NAME—Camiguin forest rat.

DISTRIBUTION—Camiguin Island only (FMNH).

HABITAT—Primary montane and mossy forest from 1000 m to 1475 m (Heaney & Tabaranza, 1997).

STATUS—Stable but very restricted geographically and threatened by logging.

COMMENT—Initially, but incorrectly, identified as a species of *Tarsomys* (Heaney & Tabaranza, 1997; Heaney et al., 1997).

Carpomys melanurus Thomas, 1895. Ann. Mag. Nat. Hist., ser. 6, 16:162.

COMMON NAME—Short-footed Luzon tree rat.

DISTRIBUTION—Known only from Mt. Data, Benguet Province, Luzon (FMNH).

HABITAT—Montane and mossy forest from about 2200 m to 2500 m (Largen, 1985; Thomas, 1898).

STATUS—Unknown; may be locally common (Thomas, 1898), but may be limited in distribution.

Carpomys phaeurus Thomas, 1895. Ann. Mag. Nat. Hist., ser. 6, 16:162.

COMMON NAME—White-bellied Luzon tree rat.

DISTRIBUTION—Northern Luzon only, recorded from Benguet and Ifugao provinces (FMNH).

HABITAT—Mossy forest from ca. 2200 m to 2500 m (Largen, 1985; Rabor, 1955; Sanborn, 1952; Thomas, 1898).

STATUS—Unknown; probably limited in distribution.

Celaenomys silaceus (Thomas, 1895). Ann. Mag. Nat. Hist., ser. 6, 16:161.

COMMON NAME—Blazed Luzon shrew-rat.

DISTRIBUTION—Northern Luzon only. Records are from high elevation forest in Benguet (FMNH).

HABITAT—In thick vegetation in mossy forest at 2200 m to 2500 m (Sanborn, 1952; Thomas, 1898).

STATUS—Uncertain; may be moderately common (PNM specimens).

COMMENT—Included within the genus *Chrotomys* by Corbet and Hill (1992).

Chiropodomys calamianensis (Taylor, 1934). Monogr. Bur. Sci. Manila., 30: 470.

COMMON NAME—Palawan pencil-tailed tree mouse.

DISTRIBUTION—Palawan Faunal Region only (Musser, 1979). Records are from Balabac (USNM), Busuanga (UIMNH), and Palawan (FMNH) islands.

HABITAT—Known only from lowland forest near sea level (Taylor, 1934), coconut groves, and bamboo thickets (Sanborn, 1952).

STATUS—Unknown.

Chrotomys gonzalesi Rickart and Heaney, 1991. Proc. Biol. Soc. Washington, 104:389.

COMMON NAME—Isarog striped shrew-rat.

DISTRIBUTION—Known only from Mt. Isarog, southern Luzon (FMNH).

HABITAT—Occurs in montane and mossy forest, ca. 1350 m and above, on Mt. Isarog (Balete & Heaney, in press; Heaney et al., in press; Rickart & Heaney, 1991; Rickart et al., 1991).

STATUS—Population stable but highly restricted in distribution, threatened by habitat destruction. IUCN: Critically endangered.

Chrotomys mindorensis Kellogg, 1945. Proc. Biol. Soc. Washington, 58:123.

COMMON NAME—Lowland striped shrew-rat.

DISTRIBUTION—Philippines only. Recorded

from Mindoro (FMNH) and lowland central Luzon (Laguna Province [USNM]). Also reported from Luzon (Nueva Ecija, Pampanga, and Tarlac provinces) (Barbehenn et al., 1973).

HABITAT—Primary and secondary forest, occasionally in adjacent agricultural areas, from near sea level to at least 1000 m (Barbehenn et al., 1973; Kellogg, 1945; Musser et al., 1981; Rickart & Heaney, 1991).

STATUS—Widespread in forest, but adversely affected by habitat destruction.

Chrotomys whiteheadi Thomas, 1895. Ann. Mag. Nat. Hist., ser. 6, 16:161.

COMMON NAME—Luzon montane striped shrew-rat.

DISTRIBUTION—Luzon only, records are from Benguet (FMNH) and Mountain provinces (PNM).

HABITAT—Recorded in mossy forest from 2300 m to 2500 m in the Central Cordillera (Largen, 1985; Rabor, 1955; Sanborn, 1952).

STATUS—Uncertain. It may be moderately common and widespread in the Central Cordillera. IUCN: Vulnerable.

Chrotomys sp. A

COMMON NAME—Sibuyan striped shrew-rat.

DISTRIBUTION—Known only from near sea level on Sibuyan Island (FMNH).

HABITAT—Lowland forest on Sibuyan (Goodman & Ingle, 1993; specimens in FMNH).

STATUS—May be restricted to a small patch of lowland forest on Sibuyan (Goodman & Ingle, 1993).

Crateromys australis Musser, Heaney, and Rabor, 1985. Am. Mus. Novit., 2821:3.

COMMON NAME—Dinagat hairy-tailed cloud rat.

HABITAT—Known only from a single specimen from Dinagat Island (Musser et al., 1985; Oliver et al., 1993a).

HABITAT—Poorly known; apparently from lowland forest.

STATUS—Unknown; geographically restricted. This species is probably badly affected by deforestation (Oliver et al., 1993a). IUCN: Endangered.

Crateromys heaneyi Gonzales and Kennedy, 1996. J. Mammal., 76:26.

COMMON NAME—Panay bushy-tailed cloud rat, Panay cloud runner.

DISTRIBUTION—Panay only (Gonzales & Kennedy, 1996; Oliver et al., 1993a).

HABITAT—Lowland primary and secondary forest to about 400 m (Gonzales & Kennedy, 1996; Oliver et al., 1993a).

STATUS—Severely impacted by habitat destruction on Panay. Highly endangered (Gonzales & Kennedy, 1996; Oliver et al., 1993a). IUCN: Endangered.

Crateromys paulus Musser and Gordon, 1981. J. Mammal., 62:515.

COMMON NAME—Ilin hairy-tailed cloud rat.

DISTRIBUTION—Known with certainty only from Ilin Island (south of Mindoro; USNM), but unverified reports suggest its presence on southern Mindoro (Oliver et al., 1993a).

HABITAT—Unknown; probably lowland forest (Musser & Gordon, 1981).

STATUS—Uncertain; geographically extremely restricted (Heaney & Utzurrum, 1991). Reported extinct on Ilin (Pritchard, 1989). Unverified reports indicate its possible occurrence on Mindoro (Oliver, 1994; Oliver et al., 1993a). IUCN: Critically endangered.

Crateromys schadenbergi (Meyer, 1895). Abh. Mus. Dresden, 6:1.

COMMON NAME—Luzon bushy-tailed cloud rat.

DISTRIBUTION—Known only from Benguet, Ifugao, and Mountain provinces, Luzon (FMNH; Oliver et al., 1993a; Sanborn, 1952).

HABITAT—From 2000 m to 2500 m in pine and mossy forest in the central Cordillera (Rabor, 1955; Sanborn, 1952).

STATUS—Apparently locally common in oak–pine forest, rare elsewhere; hunted. IUCN: Vulnerable.

Crunomys fallax Thomas, 1897. Trans. Zool. Soc. Lond. 14(6):394.

COMMON NAME—Northern Luzon shrew-mouse.

DISTRIBUTION—Known only from a single specimen taken at about 300 m in the Sierra Madre of northern Luzon (Isabela Prov. [BMNH]).

HABITAT—Unknown; possibly confined to primary lowland forest (Musser, 1982c; Thomas, 1898).

STATUS—Unknown; probably dependent on lowland forest, which has diminished greatly on Luzon. IUCN: Critically endangered. We believe this listing to be premature, given the current lack of knowledge.

COMMENT—A specimen from Cagayan Province, Luzon erroneously identified by Heaney as this species (Danielsen et al., 1994) is now being described as a new species of *Archboldomys* (Rickart et al., 1998).

Crunomys melanius Thomas, 1907. Proc. Zool. Soc. Lond., p. 141.

COMMON NAME—Southern Philippine shrew-mouse.

DISTRIBUTION—Known only from Camiguin (Heaney & Tabaranza, 1995; FMNH), Leyte (DMNH), and Mindanao (Bukidnon [FMNH], Cotabato [UPLB], and Davao del Norte [BMNH] provinces).

HABITAT—From near sea level to 900 m, probably in primary rain forest (Musser & Heaney, 1992; Heaney & Tabaranza, 1995).

STATUS—Widespread and stable in good habitat, but restricted to lowland forest, which has been greatly reduced.

COMMENT—Includes the Leyte shrew-mouse (*Crunomys rabori* Musser, 1982) (Musser & Heaney, 1992; Rickart et al., 1998).

Crunomys sp. A

COMMON NAME—Kitanglad shrew-mouse.

DISTRIBUTION—Known only from a single specimen taken at 2250 m on Mt. Kitanglad, Mindanao (Bukidnon Province [FMNH]).

HABITAT—Primary mossy forest (Rickart et al., 1998).

STATUS—Unknown.

Haeromys sp. A

COMMON NAME—Palawan pygmy tree mouse.

DISTRIBUTION—Known only from Palawan and Calauit islands in the Palawan Faunal Region (Musser & Newcomb, 1983).

HABITAT—Unknown.

STATUS—Unknown.

Limnomys sibuanus Mearns, 1905. Proc. U.S. Natl. Mus., 28:452.

COMMON NAME—Long-tailed moss-mouse.

DISTRIBUTION—Endemic to Mindanao Island. Recorded from Bukidnon (FMNH), Davao del Sur (USNM), and Misamis Occidental (USNM) provinces.

HABITAT—From 2000 m to 2800 m in primary montane and mossy rainforest (Musser, 1994; Musser & Heaney, 1992).

STATUS—Common in high-elevation forest (Heaney et al., unpubl. data).

COMMENT—The genus *Limnomys* was reviewed and redefined by Musser (1977b) and Musser and Heaney (1992).

Maxomys panglima (Robinson, 1921). Ann. Mag. Nat. Hist., ser. 9, 7:235.

COMMON NAME—Palawan spiny rat.

DISTRIBUTION—Palawan Faunal Region only. Recorded from Balabac (USNM), Busuanga (FMNH), Calauit (UPLB), Culion (FMNH), and Palawan (FMNH).

HABITAT—Secondary and primary forest from near sea level to at least 1000 m (Barbehenn et al., 1973; Hoogstraal, 1951; Musser et al., 1979; Sanborn, 1952).

STATUS—Common.

COMMENT—The genus *Maxomys* was reviewed by Musser et al. (1979) and in part by Ruedas and Kirsch (1997).

Mus musculus Linnaeus, 1758. Syst. Nat., 10th ed., 1:62.

COMMON NAME—House mouse.

DISTRIBUTION—Nearly worldwide; widespread in Southeast Asia. Found throughout the Philippines; specimens from Bohol (USNM), Leyte (DMNH), Luzon (Laguna [UPLB] Province), Maripipi (USNM), and Negros (USNM). Also reported from Mindanao (Davao del Norte Province) by Barbehenn et al. (1973).

HABITAT—Human habitations in urban and ru-

ral areas, rarely above 100 m elevation (Heaney et al., in press; Rabor, 1986).

STATUS—Non-native and abundant.

COMMENT—All Philippine populations of *Mus* are now placed in the species *M. musculus* (subspecies *castaneus*) and the species is considered to be non-native (Marshall, 1977, 1986; Marshall & Sage, 1981).

Palawanomys furvus Musser and Newcomb, 1983. Bull. Am. Mus. Nat. Hist., 174:335.

COMMON NAME—Palawan soft-furred mountain rat.

DISTRIBUTION—Palawan Faunal Region; known only from Mt. Mantalingajan, Palawan Island (USNM).

HABITAT—Unknown, but probably high mountain forest (Musser & Newcomb, 1983).

STATUS—Poorly known; probably highly restricted in distribution, possibly threatened by logging. IUCN: Endangered.

Phloeomys cumingi (Waterhouse, 1839). Proc. Zool. Soc. Lond. p. 108.

COMMON NAME—*Bugkun,* Southern Luzon giant cloud rat.

DISTRIBUTION—Luzon Faunal Region only. Recorded on Catanduanes (USNM) and southern Luzon (Camarines Sur [FMNH], Laguna [UPLB], and Quezon [UPLB] provinces; Oliver et al., 1993a). Reported from Marinduque (Steere, 1890).

HABITAT—On Mt. Isarog and Catanduanes, this species was found in disturbed lowland forest from 150 m to 900 m elevation (Heaney et al., 1991, Heaney et al., in press; Oliver et al., 1993a; Rickart et al., 1991).

STATUS—Moderately widespread and common, but heavily hunted and subject to habitat destruction (Oliver et al., 1993a). IUCN: Vulnerable.

Phloeomys pallidus Nehring, 1890. Sitzb. Ges. Naturf. Fr. Berlin, p. 106.

COMMON NAME—*Bu-ot,* Northern Luzon giant cloud rat.

DISTRIBUTION—Widespread in northern and central Luzon (Oliver et al., 1993a). Verified records from Abra (FMNH), Benguet (USNM), Kalinga-Apayao (AMNH), Laguna (UPLB), and Nueva Viscaya (UPLB) provinces (Oliver et al., 1993a). Recently verified from Bataan/Zambales region (Ong, unpubl. data).

HABITAT—From sea level to high mountains (at least 2000 m), in primary and secondary forest (Rabor, 1955; Thomas, 1898) and heavily disturbed scrub (Oliver et al., 1993a).

STATUS—Widespread and apparently common in forests; hunted (Oliver et al., 1993a; Pasicolan, 1993).

Rattus argentiventer (Robinson & Kloss, 1916). J. Strs. Br. Roy. Asiat. Soc., 73: 274.

COMMON NAME—Rice-field rat.

DISTRIBUTION—Thailand to New Guinea. In the Philippines, recorded on Cebu (UPLB), Luzon (Laguna [UPLB] Province), Mindanao (Davao del Sur [FMNH] Province), Mindoro (FMNH), and Negros (UPLB).

HABITAT—Rice-fields, grasslands, and plantations (Payne et al., 1985).

STATUS—Non-native, may be locally abundant.

COMMENT—Originally reported from the Philippines as *R. rattus umbriventer* Kellogg 1945 (Barbehenn et al., 1973; Musser, 1973).

Rattus everetti (Günther, 1879). Proc. Zool. Soc. Lond. p. 75.

COMMON NAME—Common Philippine forest rat.

DISTRIBUTION—Endemic but widespread in the Philippines, excluding the Palawan and Sulu faunal regions and the Batanes/Babuyan groups. Specimens are recorded from Biliran (USNM), Bohol (FMNH), Camiguin (DMNH), Catanduanes (FMNH), Dinagat (USNM), Leyte (USNM), Luzon (Abra [FMNH], Albay [UPLB], Aurora [UPD], Benguet [FMNH], Camarines Sur [FMNH], Laguna [USNM], Mountain Province [FMNH], Pampanga [AMNH], Quezon [UPLB], Rizal [UPLB], and Sorsogon [FMNH] provinces), Marinduque (UPD), Maripipi (USNM), Mindanao (Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Lanao del Norte [UPLB], Lanao del Sur [UPLB], Maguindanao [FMNH], Misamis Occidental [FMNH], Misamis Oriental [UPLB], South Cotabato [AMNH], Surigao del Norte [UPLB], Surigao del Sur [UPLB], and Zamboanga del Norte [FMNH] provinces),

Mindoro (FMNH), Panay (PNM), Siargao (DMNH), and Ticao (USNM). Also reported from Samar (Johnson, 1946).

HABITAT—Found in primary and disturbed lowland, montane, and mossy forest, from sea level to 2200 m on Luzon (Balete & Heaney, in press; Danielsen et al., 1994; Heaney et al., 1991, in press; Rabor, 1955) and up to 2400 m on Mindanao (Musser & Heaney, 1992; Rickart et al., 1993).

STATUS—Common in primary forest, uncommon in secondary forest, and usually absent in agricultural areas.

COMMENT—As currently defined, includes *R. albigularis, R. gala, R. tagulayensis,* and *R. tyrannus* (Musser & Heaney, 1992; Musser & Carleton, 1993).

Rattus exulans (Peale, 1848). Mammalia. In Repts. U.S. Expl. Surv., 8:47.

COMMON NAME—Polynesian rat, Small spiny rice-field rat.

DISTRIBUTION—Bangladesh to Easter Island and throughout the Philippines. Specimens taken from Balabac (USNM), Biliran (UMMZ), Bohol (USNM), Busuanga (USNM), Camiguin (DMNH), Catanduanes (USNM), Cebu (UPLB), Culion (USNM), Dinagat (USNM), Leyte (UPLB), Luzon (Laguna [USNM] Province), Marinduque (PNM), Mindanao (Davao del Sur [UPLB], Lanao del Norte [UPLB], Lanao del Sur [UPLB], Misamis Oriental [UPLB], South Cotabato [UPLB], Surigao del Norte [UPLB], and Surigao del Sur [UPLB] provinces), Negros (USNM), and Palawan (USNM). Also reported from Caluya Island (Alcala & Alviola, 1970).

HABITAT—Agricultural areas throughout the country at all elevations (Barbehenn et al., 1973; Rabor, 1986). Often present in disturbed forest (e.g., Danielsen et al., 1994) and usually rare in primary forest, but may be common in primary forest on islands such as Negros with few native rodents (Heaney et al., 1989).

STATUS—Non-native and abundant.

Rattus mindorensis (Thomas, 1898). Trans. Zool. Soc. Lond., 14:402.

COMMON NAME—Mindoro soft-furred rat.

DISTRIBUTION—Known only from Mindoro Island (FMNH).

HABITAT—Forest at 1000 m to 1500 m (Thomas, 1898).

STATUS—Apparently common at high elevations, but adversely affected by forest destruction. IUCN: Vulnerable.

Rattus nitidus (Hodgson, 1845). Ann. Mag. Nat. Hist., [ser. 1], 15:267.

COMMON NAME—Himalayan field rat.

DISTRIBUTION—Nepal to New Guinea. In the Philippines, known only from Benguet Province, Luzon (FMNH).

HABITAT—Generally in houses in hilly areas (Lekagul & McNeely, 1977).

STATUS—Non-native. May be locally abundant in highland agricultural areas, but few records from the Philippines.

Rattus norvegicus (Berkenhout, 1769). Outlines of the Natural History of Great Britain and Ireland, 1:5.

COMMON NAME—Common brown rat.

DISTRIBUTION—Worldwide. In the Philippines, reported from Luzon (Bulacan, Laguna, Nueva Ecija, and Pampanga provinces) by Barbehenn et al. (1973).

HABITAT—In the Philippines, primarily restricted to large cities and places where large ships dock (Rabor, 1986).

STATUS—Non-native and abundant in urban areas.

Rattus tanezumi Temminck, 1844. *In* Siebold, Temminck, and Schlegel, Fauna Japonica, Arnz et Socii, Lugduni Batavorum, p. 51.

COMMON NAME—Oriental house rat.

DISTRIBUTION—Afghanistan, Indo-malaya, New Guinea, and Micronesia (except the Samoas). Throughout the Philippines; recorded from Biliran (USNM), Bohol (USNM), Calauit (UMMZ), Camiguin (DMNH), Catanduanes (USNM), Cebu (UPLB), Dinagat (USNM), Leyte (USNM), Luzon (Cagayan [UMMZ], Camarines Sur [UPD], Laguna [USNM], Quezon [UMMZ], Sorsogon [FMNH], Tarlac [UPLB], and Zambales [USNM] provinces), Marinduque (PNM), Maripipi (USNM), Mindanao (Agusan del Norte [UPLB], Bukidnon [UPLB], Davao del Norte

[UPLB], Lanao del Norte [UPLB], Lanao del Sur [UPLB], Misamis Occidental [UPLB], Misamis Oriental [UPLB], North Cotabato [USNM], South Cotabato [UPLB], Surigao del Norte [UPLB], and Zamboanga del Norte [UPLB] provinces), Mindoro (UPLB), Negros (USNM), Panay (SU), Siargao (DMNH), and Siquijor (SU). Also reported from Caluya, Sibay, Semirara, Boracay, and Carabao islands (Alcala & Alviola, 1970).

HABITAT—Abundant in urban and agricultural areas, common in disturbed lowland and montane forest up to 1800 m (Danielsen et al., 1994; Heaney et al., 1989, in press; Heaney & Tabaranza, 1995; Rabor, 1986; Sanborn, 1952).

STATUS—Non-native. Abundant.

COMMENT—Formerly included within *Rattus rattus* (Musser & Carleton, 1993). Includes many populations formerly recognized as distinct species (Musser, 1977a), including *Rattus mindanensis*.

Rattus tawitawiensis Musser and Heaney, 1985. Am. Mus. Novit. 2818:5.

COMMON NAME—Tawi-tawi forest rat.

DISTRIBUTION—Known only from Tawi-tawi Island, Sulu Archipelago.

HABITAT—Unknown.

STATUS—Uncertain; geographically restricted, probably threatened by habitat destruction. IUCN: Vulnerable.

Rattus tiomanicus (Miller, 1900). Proc. Washington Acad. Sci., 2:209.

COMMON NAME—Malaysian field rat.

DISTRIBUTION—Malay Peninsula to Borneo and Palawan. In the Philippines, in Palawan Faunal Region only. Recorded from Arena (FMNH), Bancalan (FMNH), Busuanga (FMNH), Calauit (UMMZ), and Palawan (FMNH).

HABITAT—Poorly known; apparently found only in lowland areas (Sanborn, 1952). Found in secondary forest, plantations, gardens, scrub, and grassland on Borneo (Payne et al., 1985).

STATUS—Abundant in agricultural areas.

COMMENT—Formerly known as *R. jalorensis*.

Rhynchomys isarogensis Musser and Freeman, 1981. J. Mammal., 62:154.

COMMON NAME—Isarog shrew-rat.

DISTRIBUTION—Known only from Mt. Isarog, Camarines Sur Province, Luzon (FMNH).

HABITAT—Primary montane and mossy forest from 1125 m to 1750 m (Balete & Heaney, in press; Heaney et al., in press; Rickart et al., 1991).

STATUS—Geographically restricted (Musser & Freeman, 1981) and threatened by logging. IUCN: Vulnerable.

Rhynchomys soricoides Thomas, 1895. Ann. Mag. Nat. Hist., ser. 6, 16:160.

COMMON NAME—Northern Luzon shrew-rat.

DISTRIBUTION—Known only from Mt. Data, Benguet Province, Luzon (FMNH).

HABITAT—Known only from mossy forest at 2200 m to 2400 m in the Central Cordillera (Rabor, 1955; Sanborn, 1952; Thomas, 1898).

STATUS—Uncommon in high-elevation mossy forest.

Sundamys muelleri (Jentink, 1879). Notes Leyden Mus., 2:16.

COMMON NAME—Great Sunda rat.

DISTRIBUTION—Southern Burma to Palawan. Philippine records are from Balabac (USNM), Busuanga (USNM), Culion (FMNH), and Palawan (FMNH).

HABITAT—Second growth and primary forest, from sea level to 900 m (Sanborn, 1952).

STATUS—Common in forest habitats from lowlands to mossy ridge tops.

Tarsomys apoensis Mearns, 1905. Proc. U.S. Natl. Mus., 28:453.

COMMON NAME—Dusky moss-mouse, Mindanao dusky rat.

DISTRIBUTION—Known only from the highlands of Mindanao (Bukidnon [FMNH], Davao del Sur [FMNH], Misamis Occidental [SU], Misamis Oriental [FMNH], and Zamboanga del Norte [UPLB] provinces).

HABITAT—From 1550 m to 2400 m in montane and mossy forest (Musser & Heaney, 1992).

STATUS—Moderately common in high-elevation forest.

Tarsomys echinatus Musser and Heaney, 1992. Bull. Am. Mus. Nat. Hist., 211:33.

COMMON NAME—Mindanao spiny rat.

DISTRIBUTION—Known only from Mindanao

(Bukidnon [Musser, 1994] and South Cotabato [DMNH] provinces).

HABITAT—Poorly known. Apparently restricted to lowland forest.

STATUS—Uncertain. Probably formerly widespread in lowland forest on Mindanao, but may now be greatly affected by habitat destruction. IUCN: Vulnerable.

Tarsomys sp. A

COMMON NAME—Sibuyan giant moss-mouse, Sibuyan dusky rat.

DISTRIBUTION—Sibuyan Island only (FMNH).

HABITAT—Primary forest from near sea level to 1325 m (Goodman & Ingle, 1993; FMNH).

STATUS—Stable but highly restricted geographically and threatened by logging (Goodman & Ingle, 1993).

Tarsomys sp. B

COMMON NAME—Buffy-collared moss-mouse.

DISTRIBUTION—Known only from Mt. Kitanglad, Bukidnon Province, Mindanao (FMNH).

HABITAT—Known only from 2250 m to 2800 m in primary mossy forest (Heaney et al., unpubl. data).

STATUS—Moderately common in high-elevation forest, but probably restricted geographically.

COMMENT—Assignment of this and the preceding undescribed species to the genus *Tarsomys* is tentative. Both species appear to share characters with both *Tarsomys* and *Limnomys*.

Tryphomys adustus Miller, 1910. Proc. U.S. Natl. Mus., 38:399.

COMMON NAME—Luzon short-nosed rat.

DISTRIBUTION—Luzon Faunal Region; known only from Benguet (FMNH), Laguna (USNM), and Tarlac (USNM).

HABITAT—Mossy forest at about 2500 m in the Central Cordillera (Miller, 1910; Rabor, 1955) and in the lower parts of Mt. Makiling (ca. 100–350 m) (Barbehenn et al., 1973).

STATUS—Uncommon but widespread in central Luzon (Musser, 1982b). IUCN: Vulnerable.

COMMENT—The genus *Tryphomys* was reviewed and redefined by Musser and Newcomb (1983) and Musser and Heaney (1992).

Hystricidae—Porcupines

A single endemic species in this distinctive family occurs in the Philippines.

Hystrix pumila (Günther, 1879). Ann. Mag. Nat. Hist., ser. 5, 4:106.

COMMON NAME—Palawan porcupine.

DISTRIBUTION—Palawan Faunal Region. Recorded on Busuanga (FMNH) and Palawan (FMNH).

HABITAT—Lowland secondary and primary forest (Hoogstraal, 1951).

STATUS—Locally common to uncommon (Hoogstraal, 1951).

Carnivora

Felidae—Cats

Only one species of true cat occurs in the Philippines (Fig. 7); other species sometimes called cats are actually members of the family Viverridae. The one species is widespread in Southeast Asia, and has a limited distribution in the Philippines. Feral domestic cats occasionally live in forested areas on Luzon and perhaps elsewhere.

Prionailurus bengalensis (Kerr, 1792). *In* Linnaeus, Anim. Kingdom, 1:151.

COMMON NAME—Leopard cat.

DISTRIBUTION—Siberia to Pakistan and Bali. In the Philippines, documented only on Negros (FMNH) and Palawan (FMNH), and reported from Busuanga, Cebu, and Panay (Taylor, 1934; Timm & Birney, 1980).

HABITAT—Recorded in agricultural habitats and forest from sea level to about 1500 m (Rabor, 1986).

STATUS—Uncommon but widespread; heavily hunted and declining in the Philippines.

COMMENT—*Prionalurus* is now recognized as a genus, rather than a subgenus of *Felis* (Wozencraft, 1993). Populations from the Palawan Faunal Region and from the Negros–Panay Faunal Region are being described as distinct subspecies (Groves, pers. comm.).

FIG. 7. *Prionailurus bengalensis*, the leopoard cat; a rarely seen cat that is widespread in Southeast Asia but restricted in the Philippines to the Palawan and Negros–Panay faunal regions.

Mustelidae—Weasels, Otters, and Badgers

Only two species of this family occur in the Philippines, one otter and one stink-badger; the latter is a Philippine endemic.

Amblonyx cinereus (Illiger, 1815). Abh. Phys. Klasse K. Preuss. Akad. Wiss., [1804–1811] p. 99.

COMMON NAME—Oriental small-clawed otter.

DISTRIBUTION—India to Taiwan and Java; Philippine records are from Palawan Island only (FMNH).

HABITAT—Along coastal rivers and bays (Sanborn, 1952).

STATUS—Widespread, but limited distribution within the Philippines; probably uncommon.

COMMENT—*Amblonyx* was recognized as a valid genus, rather than a subgenus of *Aonyx*, by Wozencraft (1993).

Mydaus marchei (Huet, 1887). Le Naturaliste, ser. 2, 9(13):149–151.

COMMON NAME—Palawan stink-badger.

DISTRIBUTION—Palawan Faunal Region. Recorded only on Busuanga (FMNH), Calauit (Dans, unpubl. data), and Palawan (USNM).

HABITAT—Mixed grassland and second-growth forest (Hoogstraal, 1951; Rabor, 1986).

STATUS—Geographically restricted and locally moderately common to uncommon in secondary and primary lowland forest. IUCN: Vulnerable.

Herpestidae—Mongooses

A single member of this widespread family occurs in the Philippines.

Herpestes brachyurus Gray, 1837. Proc. Zool. Soc. Lond. [1836] p. 88.

COMMON NAME—Short-tailed mongoose.

DISTRIBUTION—Malay Peninsula to Borneo and

Palawan. Philippine records are from Palawan (FMNH) and Busuanga islands only.

HABITAT—Uusually found near rivers (Rabor, 1986). On Borneo, it occurs in lowland primary and secondary forest, as well as on plantations and in gardens (Payne et al., 1985).

STATUS—Widespread, probably moderately common, but current status poorly known.

Viverridae—Civets

Three species of this diverse family occur in the Philippines. Two species are widespread in the Philippines and are the only mammalian carnivores to occur in most of the country. None of the three is endemic.

Arctictis binturong (Raffles, 1821). Trans. Linn. Soc. Lond. 13:253.

COMMON NAME—Binturong.

DISTRIBUTION—Northern Burma and Yunnan to Sumatra, Java, and Borneo. In the Philippines, known only from Palawan Island (AMNH).

HABITAT—Primary and secondary lowland forest from sea level to 200 m (Rabor, 1986).

STATUS—Widespread, but Philippine populations restricted and uncommon.

COMMENT—Palawan Island specimens were originally described as a distinct species. *A. whitei* (Allen, 1910), and are periodically recognized as such.

Paradoxurus hermaphroditus (Pallas, 1777). *In* Schreber, Die Säugethiere, 3(25):426.

COMMON NAME—Common palm civet.

DISTRIBUTION—Sri Lanka to Hainan and the Lesser Sunda Islands; found throughout the Philippines. Specimens from Balabac (USNM), Busuanga (FMNH), Camiguin (FMNH), Culion (FMNH), Leyte (USNM), Luzon (Bataan [USNM], Cagayan [UMMZ], Camarines Sur [FMNH], Ilocos Norte [USNM], Isabela [AMNH], Laguna [AMNH], Pampanga [USNM], Rizal [AMNH], and Sorsogon [DMNH] provinces), Marinduque (PNM), Mindanao (Agusan del Norte [SU], Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Lanao del Sur [DMNH], Maguindanao [FMNH], Misamis Occidental [USNM], South Cotabato [FMNH], Surigao del Norte [SU], Surigao del Sur [DMNH], Zamboanga del Norte [FMNH], and Zamboanga del Sur [DMNH]), Negros (FMNH), Palawan (FMNH), Sangasanga (DMNH), and Sibuyan (FMNH). Also reported from Catanduanes (Heaney et al., 1991), Biliran, Maripipi (Rickart et al., 1993), and Panay (Timm & Birney, 1980; Lastimosa, pers. comm.).

HABITAT—Recorded in agricultural and forested areas from sea level up to at least 2400 m (Balete & Heaney, in press; Heaney et al., 1991, in press; Hoogstraal, 1951; Rabor, 1986; Thomas, 1898).

STATUS—Common and geographically widespread.

Viverra tangalunga Gray, 1832. Proc. Zool. Soc. Lond., p. 63.

COMMON NAME—Malay civet, *tangalung.*

DISTRIBUTION—Malay Peninsula to Sulawesi and Amboina; found throughout the Philippines. Specimens from Bohol (FMNH), Busuanga (FNMH), Culion (FMNH), Leyte (USNM), Luzon (Abra [FMNH], Bataan [AMNH], Camarines Sur [USNM], Cagayan [UMMZ], and Isabela [AMNH] provinces), Mindanao (Davao del Norte [FMNH], Davao del Sur [FMNH], Lanao del Sur [USNM], Maguindanao [FMNH], Misamis Occidental [USNM], and Misamis Oriental [FMNH] provinces), Mindoro (USNM), Negros (USNM), Palawan (USNM), Samar (FMNH), and Sibuyan (FMNH). Also reported from Camiguin (Heaney & Tabaranza, 1995), Catanduanes (Heaney et al., 1991), Panay (Timm & Birney, 1980; Lastimosa, pers. comm.), and Siguijor (Timm & Birney, 1980).

HABITAT—In primary and secondary lowland, montane, and mossy forest from sea level to at least 1200 m (Heaney et al., in press; Rabor, 1955; Rickart et al., 1993).

STATUS—Widespread in Asia. Moderately common in forest, rare elsewhere.

Artiodactyla

Suidae—Pigs

Three speces of wild pigs occur in the Philippines (Groves, 1997), two of which are endemic.

Sus barbatus Müller, 1838. Tijdschr. Nat. Gesch. Physiol., 5:149.

COMMON NAME—Bearded pig.

DISTRIBUTION—Malay Peninsula to Borneo and Palawan Faunal Region (Caldecott et al., 1993). Found on Busuanga (FMNH) and Palawan (FMNH). Also reported from Balabac (Taylor, 1934) and Bugsuc, Calauit, Culion, Coron, and adjacent islands (Oliver, unpubl. data).

HABITAT—Originally occurred from sea level to highest peaks, in primary and secondary forest (Rabor, 1986).

STATUS—Widespread and locally common, but heavily hunted and declining (Caldecott et al., 1993; Oliver, 1992).

COMMENT—The subspecies *S. b. ahoenobarbus* is restricted to the Palawan Faunal Region and is listed as a threatened taxon by the IUCN.

Sus cebifrons Heude, 1888. Mem. Hist. Nat. Emp. Chin., 2, pl. 17, Fig. 5.

COMMON NAME—Visayan warty pig.

DISTRIBUTION—Negros–Panay Faunal Region only. Specimens have been taken from Masbate (FMNH) and Negros (FMNH). It is also reported from Cebu, Guimaras, and Panay Islands (Oliver, 1992; Oliver et al., 1993b).

HABITAT—Originally in primary and secondary forest from sea level to mossy forest at 1600 m; now found only above 800 m.

STATUS—Extinct on Cebu and Guimaras. Heavily hunted and increasingly rare; now hybridizing with domestic pigs (Oliver, 1992). IUCN: Critically endangered.

COMMENT—Recognized as a distinct species by Groves and Grubb (1993) and Grubb (1993).

Sus philippensis Nehring, 1886. Sber. Ges. Naturf. Fr., Berlin, p. 83.

COMMON NAME—Philippine warty pig.

DISTRIBUTION—Biliran (UMMZ), Catanduanes (FMNH), Leyte (USNM), Luzon (Abra [FMNH], and Rizal [FMNH] provinces), Mindanao (Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], Maguindanao [FMNH], North Cotabato [FMNH], South Cotabato [FMNH], and Zambonanga del Norte [FMNH] provinces), and Mindoro (FMNH). Also reported from Basilan, Samar (Oliver, 1992), and Camiguin (Heaney & Tabaranza, unpubl data).

HABITAT—Formerly abundant from sea level to at least 2800 m, in virtually all habitats (Rabor, 1986); now common only in remote forests (Danielsen et al., 1994; Heaney et al., 1991, in press).

STATUS—Heavily hunted, declining rapidly (Garcia & Deocampo, 1995). Also threatened by hybridization in some areas. Extinct on Marinduque (Oliver, 1992).

COMMENT—Recognized as a distinct species by Grubb (1993).

Tragulidae—Mouse-deer

A single species of this unusual family barely enters the Philippines.

Tragulus napu (F. Cuvier, 1822). *In* É. Geoffroy and F. Cuvier, Hist. Nat. Mammifères, part 2, 4(37): 4 pp.

COMMON NAME—Greater mouse-deer.

DISTRIBUTION—Southern Indochina to Java and Borneo. In the Philippines, recorded only on Balabac (FMNH) and adjacent small islands, including Bugsuc and Ramos (Oliver, unpubl. data).

HABITAT—Primary and secondary forest and scrub (Hoogstraal, 1951; Rabor, 1986).

STATUS—Species widespread and common. The Philippine population is highly restricted but reported to be locally common in some areas in 1993, despite continuous heavy hunting pressure (Oliver et al., unpubl. data).

Cervidae—Deer

Three species of deer occur in the Philippines, all of which are endemic to the country. A tentative report of a possibly introduced population of *Cervus nippon* on Jolo (Grubb & Groves, 1983) has yet to be confirmed (Heaney et al., 1987).

Axis calamianensis (Heude, 1888). Mem. Hist. Nat. Emp. Chin. 2:49.

COMMON NAME—Calamian hog-deer

DISTRIBUTION—Palawan Faunal Region only

Recorded on Busuanga (FMNH) and Culion (FMNH).

HABITAT—Grasslands and second growth (Hoogstraal, 1951).

STATUS—Vulnerable because of a very limited range and continued hunting pressure (Oliver, 1994). IUCN: Endangered. CITES: Appendix I. U.S. ESA: Endangered.

COMMENT—Regarded as a valid species by Grubb (1993) and Corbet and Hill (1992), with all authors recognizing *Axis* as a genus rather than a subgenus of *Cervus.*

Cervus alfredi Sclater, 1876. Proc. Zool. Soc. Lond., p. 381.

COMMON NAME—Visayan spotted deer.

DISTRIBUTION—Philippines only; Cebu, Guimaras, Masbate, Negros, and Panay islands (Oliver, 1994; Oliver et al., 1992).

HABITAT—Formerly from sea level to at least 1500 m in primary forest and second growth.

STATUS—Geographically restricted and rare. Now extinct on Cebu, Guimaras, and probably Masbate. Heavily hunted, severely endangered (Cox, 1987; Evans et al., 1993; Oliver, 1994; Oliver et al., 1992). IUCN: Endangered. U.S. ESA: Endangered.

COMMENT—Recognized as a distinct species by Grubb and Groves (1983).

Cervus mariannus Desmarest, 1822. Mammalogie. In Encycl. Meth., 2:436.

COMMON NAME—Philippine brown deer.

DISTRIBUTION—Originally restricted to the Philippines but introduced into the Marianna Islands. Occurs throughout most of the Philippines except the Negros–Panay Faunal Region, the Babuyan/Batanes groups, the Palawan Fanual Region, and the Sulu Faunal Region (Oliver et al., 1992). Recorded on Basilan (FMNH), Catanduanes (FMNH), Leyte (USNM), Luzon (Isabela [UMMZ] Province), and Mindanao (Bukidnon [FMNH], Davao del Norte [FMNH], Davao del Sur [FMNH], and South Cotabato [FMNH] provinces). Extinct on Biliran (Rickart et al., 1993). Also reported from Mindanao (Augusan del Norte Province) by Sanborn (1953).

HABITAT—Formerly from sea level to at least 2900 m in primary and secondary forest (Heaney et al., in press; Rabor, 1986; Sanborn, 1952; Taylor, 1934).

STATUS—Locally common in isolated areas, but heavily hunted and declining (e.g, Danielsen et al., 1994). Local extinctions have been reported on Catanduanes and Biliran (Heaney et al., 1991; Rickart et al., 1993).

COMMENT—Substantial variation in size and color often exist in limited areas. Further taxonomic study is needed.

Bovidae—Cattle

A single species in this family is native to the Philippines. It is one of the most seriously endangered species in the family.

Bubalus mindorensis (Heude, 1888). Mem. Hist. Nat. Emp. Chin., 2:4.

COMMON NAME—Tamaraw, Mindoro dwarf buffalo.

DISTRIBUTION—Endemic to the Mindoro Faunal Region; found in remote areas on Mindoro only (FMNH).

HABITAT—Originally from sea level to high peaks on Mindoro, but now confined to a few remote areas in rough terrain. Probably prefers second growth and mixed forest/grassland (Kuehn, 1986; Custodio et al., 1996).

STATUS—Rare and geographically restricted; severely endangered and declining (Custodio et al., 1996; Oliver, 1994). IUCN: Endangered. CITES: Appendix I. U.S. ESA: Endangered.

COMMENT—Groves (1969) assigned the tamaraw to the subgenus *Bubalus,* rather than to *Anoa.*

Cetacea

Twenty-one species of cetaceans have been reliably documented from Philippine waters (Alava et al., 1993; Tan, 1995). Additionally, there are unconfirmed or suspected occurrences of the following species (Leatherwood et al., 1992): *Balaenoptera musculus, Delphinus delphis, Hyperoodon* sp., *Mesoplodon ginkgodens,* and *Sousa chinensis.*

Balaenopteridae—Rorquals

Three of the six species in this family occur in the Philippines.

Balaenoptera acutorostrata Lacépède, 1804. Hist. Nat. Cetacees, p. 134.

COMMON NAME—Minke whale.

DISTRIBUTION—Worldwide. Very rare in some tropical pelagic areas such as the eastern tropical Pacific (Jefferson et al., 1994). In the Philippines, a stranding was reported by Herre (1925) at Bacoor, Cavite Province (Luzon), but individuals have yet to be sighted at sea.

HABITAT—Coastal, inshore, and offshore areas.

STATUS—Apparently uncommon (Klinowska, 1991). CITES: Appendix I. IUCN: Insufficiently known.

Balaenoptera edeni Anderson, 1878. Anat. Zool. Res., Yunnan, p. 551, pl. 44.

COMMON NAME—Bryde's whale, tropical whale.

DISTRIBUTION—Tropical and subtropical zones. This species generally does not move beyond 40° in either hemisphere (Jefferson et al., 1994). In the Philippines, sighted in Panay Gulf and the eastern Sulu Sea in May, 1995 (Dolar, unpubl. data). Skeleton specimens are housed in SUML.

HABITAT—Coastal and offshore waters.

STATUS—Scarce and poorly known (Klinowska, 1991). This species is being exploited by hunters from Pamilacan, Bohol, and Camiguin (north of Mindanao). Hunting grounds are the Bohol Sea (sometimes called the Mindanao Sea) and the eastern Sulu Sea (Dolar et al., 1994; Leatherwood et al., 1992). CITES: Appendix I. IUCN: Insufficiently known.

COMMENT—Philippine Bryde's whales may be the small coastal form of Bryde's whales found in other regions. Morphometric studies showed that they are relatively smaller than those found in other regions (Perrin et al., 1996b). Genetic studies are currently being done to investigate the validity of this group as a separate species. Preliminary results indicate that the Southeast Asian group is genetically different from all other populations of Bryde's whale and may deserve recognition as a separate species (Dizon et al., 1996).

Megaptera novaeangliae (Borowski, 1781). Gemein. Naturgesch. Thier., 2(1): 21.

COMMON NAME—Humpback whale.

DISTRIBUTION—Worldwide. Sighted near southeastern Palawan, northwest of Luzon and off western Mindanao (Slijper et al., 1964).

HABITAT—Feed and breed in coastal waters and migrate from the tropics to polar and subpolar regions, reaching the ice edges in both hemispheres (Jefferson et al., 1994).

STATUS—Generally rare (Klinowska, 1991). This species has not been sighted in Philippine waters in recent years. CITES: Appendix I. IUCN: Vulnerable.

Delphinidae—Ocean Dolphins

Twelve of the 32 species in this family occur in the Philippines. None is endemic.

Feresa attenuata Gray, 1875. J. Mus. Godeffroy (Hamburg), 8:184.

COMMON NAME—Pygmy killer whale.

DISTRIBUTION—Circumtropical and subtropical waters, generally not ranging beyond 40°N and 35°S (Jefferson et al., 1994). This species has been sighted in the Bohol Sea, Bohol Strait, Tanon Strait, and eastern Sulu Sea (Dolar & Perrin, 1996; Dolar & Wood, 1993; Leatherwood et al., 1992). Specimens are from the eastern Sulu Sea (SUML).

HABITAT—Oceanic.

STATUS—Moderately common in Philippine waters. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Globicephala macrorhynchus Gray, 1846. Zool. Voy. H.M.S. "Erebus" and "Terror", 1:33.

COMMON NAME—Short-finned pilot whale.

DISTRIBUTION—Warm temperate to tropical waters, usually between 50°N and 40°S. Sighted in the Sulu and Bohol seas and Tanon Strait (Dolar & Wood, 1993; Leatherwood et al., 1992). Strandings recorded in Calategas, Narra, Palawan, and Binmaley, Pangasinan Province, Luzon (Leatherwood et al., 1992). Specimens are in the SUML, UPLB, and AMNH.

HABITAT—Usually deep offshore areas. In the Philippines, often found over or near steep slopes (Dolar & Perrin, 1996).

STATUS—Common in the Philippines. CITES:

Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

COMMENT—In the eastern Pacific, often found associated with other species (e.g., bottlenose, Pacific white-sided, and Risso's dolphins and sperm whales; Jefferson et al., 1994). In the Sulu Sea, Philippines, found with Fraser's dolphins in 85% of the total sightings (Dolar & Perrin, 1996).

Grampus griseus (G. Cuvier, 1812). Ann. Mus. Hist. Nat. Paris, 19:13.

COMMON NAME—Risso's dolphin.

DISTRIBUTION—Worldwide. Sighted in the Tanon Strait, Visayan Sea, Bohol Sea, Cebu Strait, Camotes Sea, eastern Sulu Sea, Celebes Sea, eastern China Sea (Dolar & Perrin, 1996; Dolar & Wood, 1993; Hammond & Leatherwood, 1984; Leatherwood et al., 1992), and southern Sulu Sea (Dolar & Perrin, unpubl. data). Specimen known from eastern Sulu Sea (SUML).

HABITAT—Coastal and offshore waters.

STATUS—Moderately common in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Lagenodelphis hosei Fraser, 1956. Sarawak Mus. J., n.s., 8(7):496.

COMMON NAME—Fraser's dolphin.

DISTRIBUTION—Pantropical, largely between 30°N and 30°S. Distributed widely in the Philippines. Sighted in the Bohol Sea, Cebu Strait, Sulu Sea, and Celebes Sea (Dolar & Perrin, 1996; Dolar & Wood, 1993; Leatherwood et al., 1992; Hammon & Leatherwood, 1984). Specimens are from the eastern Sulu Sea (SUML).

HABITAT—Oceanic but can be seen nearshore in areas where deep water approaches the coast as in the Philippines (Dolar & Perrin 1996; Jefferson et al., 1994).

STATUS—Very common in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Orcinus orca (Linnaeus, 1758). Syst. Nat., 10th ed., 1:77.

COMMON NAME—Killer whale, orca.

DISTRIBUTION—Worldwide. Sighted only once, in the Sulu Sea (Dolar & Perrin, 1996).

HABITAT—Found in almost any marine region, including nearshore, offshore, and oceanic waters. The species is known to ascend rivers (Jefferson et al., 1994).

STATUS—Apparently rare in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Peponocephala electra (Gray, 1846). Zool. Voy. H.M.S. "Erebus" and "Terror", 1:35.

COMMON NAME—Melon-headed whale.

DISTRIBUTION—Tropical and subtropical oceanic waters between 40°N and 35°S (Jefferson et al., 1994). In the Philippines this species is seen in relatively shallow waters. It is locally common in the Tanon Strait and near Siquijor Island. Sighted in the eastern Sulu and Bohol seas (Dolar & Perrin, 1996; Dolar & Wood, 1993; Leatherwood et al., 1992) and Tanon Strait (Dolar & Perrin, unpubl. data) and Cebu Strait (Hammond & Leatherwood, 1984).

HABITAT—Coastal and oceanic waters. In the Philippines only seen in relatively shallow waters (≤ 200 fathoms) close to shore.

STATUS—Locally common in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Pseudorca crassidens (Owen, 1846). Hist. Brit. Foss. Mamm. Birds, p. 516, Fig. 213.

COMMON NAME—False killer whale.

DISTRIBUTION—Tropical to warm temperate zones. Do not range beyond 50° in either hemisphere. Sighted in the Philippine Sea (northeast and east of Luzon) and the South China Sea (northwest of Luzon; Ferrin et al., 1996a).

HABITAT—Deep offshore waters. In the Philippines, the most inshore locality was approximately 80 km northeast of San Miguel Bay, Luzon (Perrin et al., 1996a).

STATUS—Insufficiently known, probably uncommon in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Stenela attenuata (Gray, 1846). Zool. Voy. H.M.S. "Erebus" and "Terror", 1: 44.

COMMON NAME—Pantropical spotted dophin.

DISTRIBUTION—Tropical and subtropical zones.

Found in all oceans betwen 40°N and 40°S, although more abundant in lower latitudes (Jefferson et al., 1994). Sighted in the Sulu Sea, South China Sea (west of Palawan), Tanon Strait, Cebu Strait, Bohol Sea, Batangas Bay, Verde Island Passage, and Celebes Sea (Dolar et al., 1994; Dolar & Perrin, 1996; Dolar & Wood, 1993; Hammond & Leatherwood, 1984; Leatherwood et al., 1992). Specimens are from the eastern Sulu Sea and Bohol Sea (SUML).

HABITAT—Nearshore and offshore waters.

STATUS—Abundant in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Stenella coeruleoalba (Meyen, 1833). Nova Acta Acad. Caes. Nat. Curios., 16(2):609, pl. 43.

COMMON NAME—Striped dolphin.

DISTRIBUTION—Primarily in warm waters, but also sometimes seen in temperate regions (between 50°N and 40°S) (Jefferson et al., 1994). Sighted in the Philippine Sea (northeast of Luzon) and the South China Sea (northwest of Luzon and west of Batanes; Perrin et al., 1996a).

HABITAT—Oceanic waters. Seen near shore only when deep water approaches the coast (Jefferson et al., 1994).

STATUS—Insufficiently known, probably uncommon in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Stenella longirostris (Gray, 1828). Spicil. Zool., 1:1.

COMMON NAME—Spinner dolphin.

DISTRIBUTION—Tropical and subtropical zones, between 40°N and 40°S. Sighted in the China Sea (west of Palawan), Sulu Sea, Bohol Sea, Tanon Strait, Cebu Strait, Verde Island Passage, Camotes Sea, Batangas Bay, and Celebes Sea (Dolar & Perrin, 1996; Dolar & Wood, 1993; Hammond & Leatherwood, 1984; Leatherwood et al., 1992). Specimens are from the Sulu and Bohol seas (SUML).

HABITAT—Nearshore and oceanic waters.

STATUS—Most abundant dolphin in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Steno bredanensis (Lesson, 1828). Hist. Nat. Gen. Part. Mamm. Oiseaux, 1:206.

COMMON NAME—Rough-toothed dolphin.

DISTRIBUTION—Tropical to subtropical, between 40°N and 35°S. Sighted in the Sulu Sea (Dolar, unpubl. data), accidentally caught in a fishery in the Celebes Sea (Dolar & Wood, 1993).

HABITAT—Deep oceanic waters.

STATUS—Uncommon in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Tursiops truncatus (Montagu, 1821). Mem. Wernerian Nat. Hist. Soc., 3:75, pl. 3.

COMMON NAME—Bottlenose dolphin.

DISTRIBUTION—Tropical and temperate, between 45°N and 45°S. Sighted in the Sulu Sea, Bohol Sea, Tanon Strait, Batangas Bay, Verde Island Passage, and Ulugan Bay (Dolar & Perrin, 1996; Dolar & Wood, 1993; Leatherwood et al., 1992). Locally common in the Panay Gulf and southern Sulu Sea (Dolar & Perrin, unpubl. data).

HABITAT—Often found in nearshore and inshore waters. Also found to inhabit pelagic waters (Jefferson et al., 1994).

STATUS—Locally common in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Kogiidae—Dwarf and Pygmy Sperm Whales

There are two species in this family and both occur in the Philippines.

Kogia breviceps (de Blainville, 1838). Ann. Franc. Etr. Anat. Phys., 2:337.

COMMON NAME—Pygmy sperm whale.

DISTRIBUTION—Tropical to warm temperate zones of all oceans. This species has been sighted in Tanon Strait, and a skeleton was obtained from Pamilacan, Bohol (Dolar & Perrin, 1996; Dolar & Wood, 1993; Leatherwood et al., 1992).

HABITAT—Often found over and near the continental slope.

STATUS—Uncommon in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Kogia simus (Owen, 1866). Trans. Zool. Soc. Lond., 6(1):30, pls. 10–14.

COMMON NAME—Dwarf sperm whale.

DISTRIBUTION—Appears to be distributed widely in tropical to warm temperate areas. Sighted in the Tanon Strait, Bohol Sea, and eastern Sulu Sea (Dolar & Perrin, 1996; Dolar & Wood, 1993; Leatherwood et al., 1992). Specimens are from the Sulu Sea and Bohol Sea (SUML).

HABITAT—Appear to be distributed largely offshore. Commonly found in inshore waters in Tanon Strait (Dolar & Perrin, unpubl. data).

STATUS—Locally common in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

COMMENT—Has been observed frequently in Tanon Strait. Average sighting is between 6–8/day (10 hr survey time; Dolar & Perrin, 1996).

Physeteridae—Sperm Whales

The sole species in this family is present in the Philippines.

Physeter catodon Linnaeus, 1758. Syst. Nat., 10th ed., 1:76.

COMMON NAME—Sperm whale.

DISTRIBUTION—Worldwide. Sighted in the Sulu, Bohol, and Celebes seas (Dolar & Perrin, 1996; Dolar & Wood, 1993; Leatherwood et al, 1992). A stranding was recorded in Palawan (Leatherwood et al., 1992). A specimen was taken from the Sulu Sea (SUML).

HABITAT—Oceanic, but also found nearshore where deep water occurs near the coast (Jefferson et al., 1994).

STATUS—Commonly seen in some areas. CITES: Appendix I. U.S. ESA: Endangered. IUCN: Insufficiently known (Klinowska, 1991).

Ziphiidae—Beaked Whales

Two of the 19 species in this family are known to occur in the Philippines. Some unidentified beaked whales have been sighted in the Sulu Sea (Dolar & Perrin, unpubl. data). It is probable that these represent one or more additional species.

Mesoplodon densirostris (de Blainville, 1817). Nouv. Dict. Hist. Nat., Nouv. ed., 9:178.

COMMON NAME—Blainville's beaked whale, dense beaked whale.

DISTRIBUTION—Temperate and tropical waters in all oceans. Sighted in the Bohol and Sulu seas (Dolar & Perrin, 1996). Specimen taken from the Bohol Sea (SUML).

HABITAT—Usually in offshore and deep waters. Sometimes found in deep inshore waters in the Philippines.

STATUS—Moderately common. CITES: Appendix II. IUCN: Insufficiently known.

Ziphius cavirostris G. Cuvier, 1823. Rech. Oss. Foss., Nouv. ed., 5(1):350.

COMMON NAME—Cuvier's beaked whale.

DISTRIBUTION—Widely distributed in offshore waters of all oceans. In the Philippines, it was sighted in the south Sulu Sea, east of Mapun (Cagayan de Tawi-tawi) on 8 May 1996 (Dolar & Perrin, unpubl. data), and one was caught in a drift gillnet in the eastern Sulu Sea on 10 June 1996 (SUML).

HABITAT—Deep offshore waters.

STATUS—Poorly known, probably uncommon. IUCN: Insufficiently known (Klinowska, 1991).

Phocoenidae—Porpoises

One of the six species in this family occurs in the Philippines.

Neophocaena phocaenoides (G. Cuvier, 1829). Règne Anim., Nouv. ed., 1:291.

COMMON NAME—Finless porpoise.

DISTRIBUTION—Indo-pacific waters, tropical to temperate zones. Sighted in the South China Sea, northwest of Palawan (Tan, 1995).

HABITAT—Generally found in shallow waters, both in marine and estuarine areas, or even great distances up some rivers (e.g., the Yangtze River in China).

STATUS—Uncommon in the Philippines. CITES: Appendix II. IUCN: Insufficiently known (Klinowska, 1991).

Sirenia

Dugongidae—Dugongs and Sea Cows

There is only one living species in this family. It formerly occurred throughout much of the Philippines.

Dugong dugon (Müller, 1776). Linne's Vollstand. Natursyst. Suppl., p. 21.

COMMON NAME—Dugong.

DISTRIBUTION—Tropical coasts of Indian and Pacific oceans. Existing reports and interviews suggest that dugongs previously were present throughout the Philippine Archipelago. Areas in the Philippines known to have had dugongs include Mindoro, Zambales, Palawan, Camarines Norte, Manila, Cebu, Zamboanga, Tacloban, Panay Island, Sulu Archipelago, Catanduanes, Masbate, Polillo Island, Bicol Region, Iloilo, Balut Island in Sarangani Bay, Palanan in Isabela, Agusan del Norte, Samar, Aparri, Mati in Davao del Sur, Misamis, Cuyo, Pangasinan, Bataan, and Cavite (Yaptinchay, 1994). More recently, this species has been recorded from Culion (FMNH), El Nido, (Kataoka, 1987, in Yaptinchay, 1994), Shark Fin Bay, Taytay, Palawan; Calauit Island and Gutob Bay, Busuanga (Trono et al., 1993, in Yaptinchay, 1994). Reported in ca. 1991 from northeastern Luzon (Danielsen et al., 1994). In Romblon Province and Bicol (southern Luzon), interview respondents confirmed presence and exploitation of dugongs (Yaptinchay, 1994). A calf was stranded in Romblon Province in May 1993 (Yaptinchay, 1994).

HABITAT—Shallow tropical seas with abundant sea-grass.

STATUS—Has been heavily exploited in the Philippines, almost to extinction. CITES: Appendix I. IUCN: Vulnerable. U.S. ESA: Endangered.

COMMENT—Until the late 1970s, dugongs were reported present in most of the areas mentioned above. Today, Palawan is the only place in the Philippines where reports are regularly received and confirmed (Yaptinchay, 1994).

Discussion and Conclusion

The mammalian fauna of the Philippines is a remarkable assemblage of species that occur from the depths of the sea to the tops of cloud-enshrouded mountains. The data provided here are brief and limited, but they provide a clear overview of this fauna. Although we refer the reader to recent summaries of zoogeography and conservation status for details (Heaney, 1986, 1991b, 1993; Heaney et al., 1997), several key features will be apparent from perusal of this listing.

First, the terrestrial fauna of the Philippines is divided into a series of centers of endemism. These centers correspond to the islands that existed in the Philippines during periods of glacial development in high-latitude regions and consequent low sea level worldwide. Every one of these ice-age islands that has been investigated, including the tiny islands of Camiguin and Sibuyan, supports at least two endemic species, and most islands have many more endemic species (Heaney, 1985b, 1986, 1991b, 1993). The sole exception to this pattern is Siquijor, which has no endemic species, but also has virtually no native vegetation remaining (Lepiten, 1995).

Second, native terrestrial mammalian species occur at every elevation and in every type of forest habitat that remains in existence in the country (e.g., Heaney et al., 1989; Rickart, 1993; Rickart et al., 1991). On the other hand, few native species are known to survive in deforested habitats, and many native species cannot survive in disturbed forest (Heaney, 1993; Heaney & Utzurrum, 1991).

Third, at least 50 species of terrestrial mammals currently are known to be threatened to varying degrees, some critically so. Many others that are poorly known at present are certain to be added to this number as more information becomes available (Heaney, 1993; Heaney & Utzurrum, 1991; Oliver & Heaney, 1996; Utzurrum, 1992). Endangered species occur in every faunal region and in all types of natural (undisturbed) habitat. Populations of most endemic species have declined significantly, the vast majority as a result of forest habitat destruction. It is clear that forest destruction has been and remains at present the primary conservation problem on land in the Philippines. Additionally, overhunting has had a severe impact on most large terrestrial species and several marine species, and disturbance and destruction of caves has had a major impact on many species of bats (Utzurrum, 1992). Whale hunting in the Bohol Sea by fishermen from Pamilacan, Bohol, and Camiguin has almost completely wiped out the Philippine population of Bryde's whale. This population is part of the Southeast

Asian group found to be morphologically and genetically different from all other Bryde's whales and may deserve recognition as a separate species (Perrin et al., 1996b; Dizon et al., 1996).

Fourth, the rich marine mammal fauna is associated with the archipelagic nature of the country, which has resulted in the usual bathymetric topography of its marine environment. Small islands are surrounded by very deep oceanic waters (the Philippines have some of the deepest waters in the world), and conversely, deep oceanic waters are often isolated from each other by narrow, shallow sills as well as by islands. This situation has resulted in complex marine habitats and affected the distribution of cetaceans. It is common to find cetaceans that are considered to be "offshore oceanic species" (e.g., Fraser's dolphin, *Lagenodelphis hosei*) only 30 m off an island in the Philippines, which makes them "coastal" species as well. This has also changed the whole suite of species associations and assemblages usually seen elsewhere, making the Philippine situation quite exceptional.

Fifth, the mammalian fauna of many parts of the Philippines, both marine and terrestrial, remains poorly known. Detailed, extensive, and quantitative field studies are crucial in enhancing knowledge of the fauna. Superficial study will not yield information on rare or elusive species, nor will it provide the basic data required for long-term management decisions.

The data presented in this paper paint a brief picture of one of the most remarkable mammalian faunas on Earth: giant bushy-tailed rats, dwarf buffalos, bats with nearly 6-ft. wingspans, burrowing rodents with white stripes, and "flying lemurs" that neither fly nor are lemurs. These species form a remarkable community of animals that may be viewed as forming a vast natural experiment in the evolution and maintenance of mammalian diversity. Uncovering the story of the origin and ecology of this diversity has provided one of the major incentives to us in carrying out the research on which much of this synopsis is based. A part of the picture, however, is recent and continuing destruction of forests and reefs, leaving too many species with only a few places that can sustain them. It is neither an exaggeration nor unwarranted melodrama to say that unless effective action is taken soon to protect the native habitats of these animals, one of the most remarkable stories of mammalian evolution on Earth will end, and an irreplaceable part of the Filipino heritage will be lost forever. It is our hope that this paper will assist in the process of developing effective protection for the environment of the people and the wildlife of the Philippines, solidly based on knowledge, and dedicated to providing a stable environment for all.

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